

THE AUTOMOBILE CLUB OF AMERICA

105TH STREET, E.

NEW YORK.

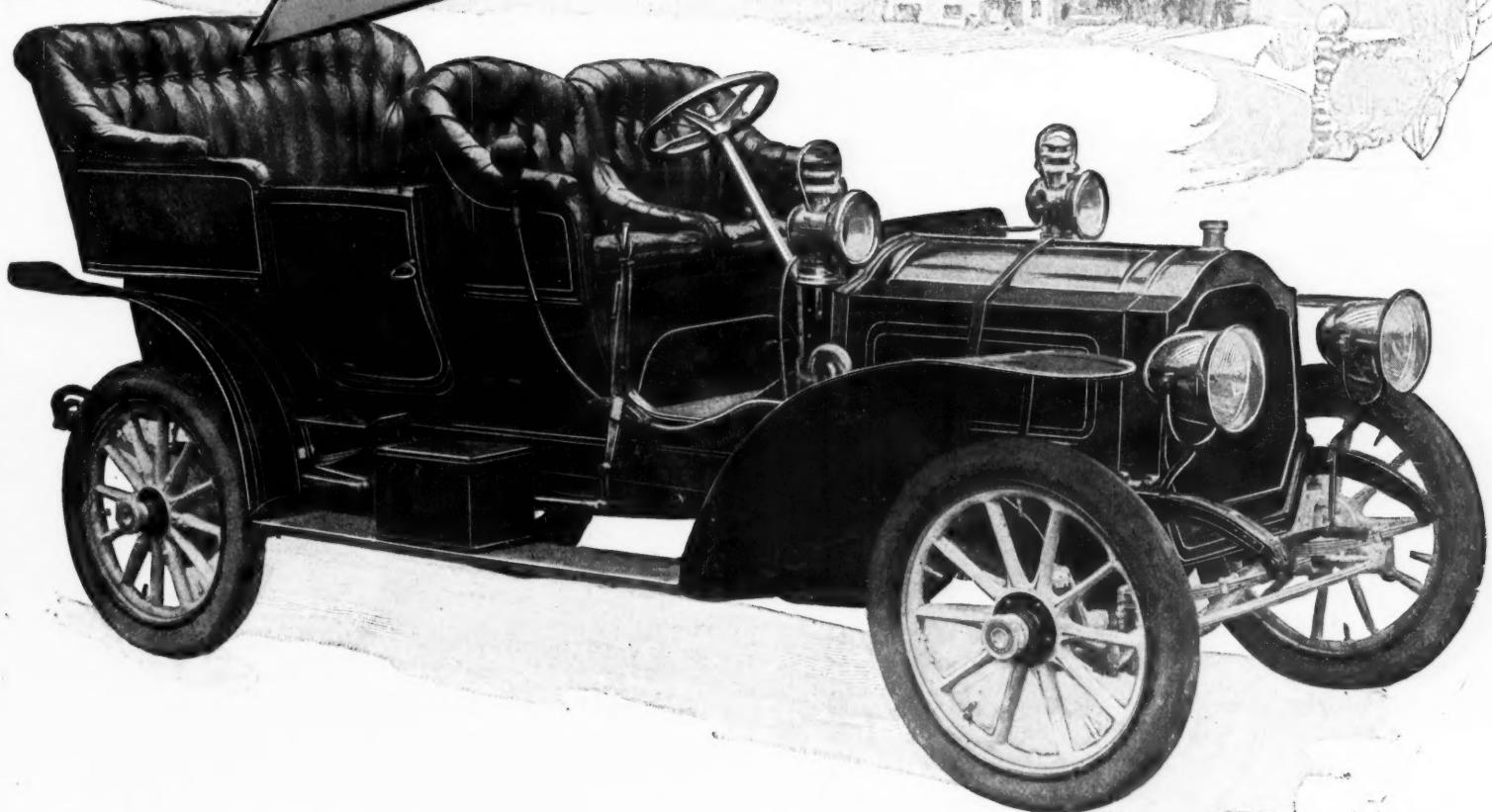
MOTOR AGE

Vol. VIII No. 26

CHICAGO, DECEMBER 28, 1905

Ten Cents per Copy

Packard



BEFORE the design of the "Packard 24" was accepted by the Packard Company, three cars were built and driven 21,000 miles over every kind of road and grade that exists between Michigan and Massachusetts.

PACKARD MOTOR CAR COMPANY

Dept. 2 Detroit, Michigan

Members Association Licensed Automobile Manufacturers

New York Branch, 1540 Broadway

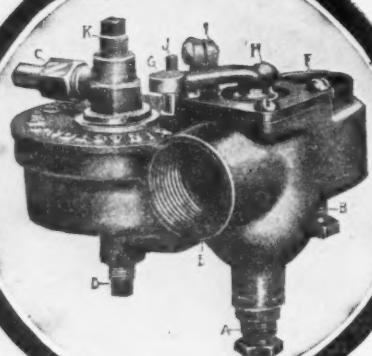


We most heartily extend to our patrons and friends everywhere our sincere best wishes for a Holiday Season of surpassing Good Cheer.

We are not unmindful of the good-will that has been so generously manifested on the part of our patrons during the past year; and for this, and for the constantly increasing liberality of their patronage, we are deeply grateful.

We pledge you that an earnest effort will be made to merit a continuance of your valued confidence.

Morgan & Wright
Chicago



KINGSTON 1906 TYPE-K- AUTOMATIC CARBURETOR

EASY TO UNDERSTAND *EASY TO OPERATE*

Fuel controlled entirely by equalizing automatic air valves.

Will increase POWER and CONTROL of any 1905 FORD or OLDS car, or money back.

Positively will not accumulate fuel in, or CLOG LONG INLET PIPES.

Perfectly adapted to gasoline cars, boats, airships and motors for any kind of service.

Built for business by the oldest manufacturers in the business.

OVER 31,000 KINGSTON CARBURETORS IN USE

KINGSTON MUFFLER



**IMPROVED
FOR 1906**

BYRNE, KINGSTON & CO.,

KOKOMO, INDIANA, U. S. A.

MOTOR AGE

VOL. VIII NO. 26

CHICAGO, DECEMBER 28, 1905

\$2.00 Per Year

FRENCH SHOW REVEALS NEW IDEAS



ENTRANCE OF THE GRAND PALAIS AT NIGHT

Paris, Dec. 13—Visits to the Paris show after the rush and crowds of the opening day reveal a great many changes in detail, but a general settling down in main lines of construction. Both users and designers now appear to know what is wanted, and there is a tendency towards uniformity of type. Small vehicles are especially numerous as compared with previous years, and French constructors after so long neglecting the runabout are now giving to it the closest attention. There are chassis sold as low as \$395, and for this modest sum is furnished by the Prima company a chassis with pressed steel frame, single-cylinder vertical motor of 7-9 horsepower, running at 1,500 revolutions and having mechanically operated inlet and exhaust valves. There are three speeds and reverse by one lever, and a

double sliding gear. Transmission is by propeller shaft. There is an automatic lubricator and a pump with direct drive. Dunlop or Hutchinson tires are fitted.

Sizaire & Naudin offer a runabout with single-cylinder motor, three speeds, with direct drive on the high, shaft drive, side frames all wood, and two-seated body in leather, for \$590. The Elegant is sold for \$385 with single-cylinder de Dion motor, three speeds and reverse, wooden wheels, big tires and a two-seated body. For \$450 the same chassis with a 9-horsepower de Dion motor is supplied, and for \$900 a 20-horsepower four-cylinder car can be obtained. These are but a few of the many small cars sold at similarly low prices by the French manufacturers.

The Panhard & Levassor firm exposes a 35-horsepower chassis, a 15-horsepower coupé with body by Rothschild, a 24-horsepower limousine with body work by La-

bourette, and a 24-horsepower limousine by Berton Labourdette. The novelty in body work at this stand is the limousine cab, in which the driver is completely enclosed. The dash is heightened and curved inwards over the steering wheel, from which point is a glass front going up to the roof. Entrance to the fore compartment is by a door on the left hand side of the car opening from back to front, the two doors giving access to rear of car opening in the opposite direction. The 35-horsepower chassis is practically the same as the 50-horsepower shown last year. It has four separate cylinders, Eiseman magneto under the hood, gear-driven. Water circulation is by centrifugal pump, gear-driven. There is double sliding gear with direct drive on the high, without the intermediary shaft turning. The side



VIEW OF THE MAIN PORTION OF THE GRAND PALAIS DURING THE PARIS AUTOMOBILE SHOW

frames are in wood and steel, as on previous year's models. A new patented shock absorber is shown on the 35-horsepower Panhard. On the 15-horsepower chassis is a dynamo used for charging the accumulators employed for lighting the car. When a dynamo which has to be frequently run at a low speed, or even stopped altogether, is used for charging accumulators, it is essential to have some apparatus preventing the discharge of the accumulators as soon as the voltage of the current produced by the dynamo is insufficient. The chassis exposed is fitted with a disconnector automatically isolating the dynamo from the accumulators as soon as the state of the dynamo requires it. A patent for both home and abroad has been secured for this by the Panhard firm.

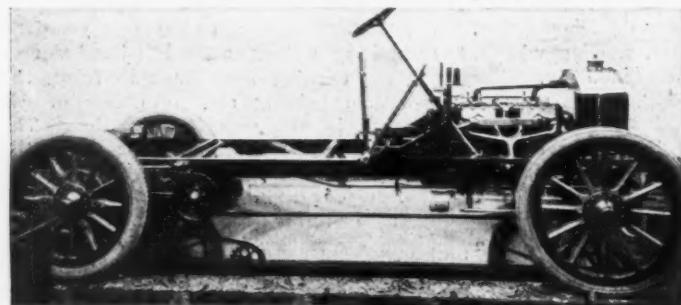
On the Charron, Girardot & Voigt stand the novelty is a chassis with steering mechanism on the left, and intended for town use. It is claimed that with the driver on

the left hand side instead of on the right there is greater ease in negotiating town traffic than when he sits to the right. The suspension has been most carefully thought out, for in addition to the transverse rear spring there are longitudinal springs and C springs. The side frames are raised considerably at the rear, this chassis being intended to take a coupé or landaulet body. A 14-horsepower four-cylinder motor is carried under the usual form of C. G. V. bonnet, with radiator below the front of the chassis. Transmission is by cardan shaft; there are four speeds and reverse, with the high speed driving direct. Sparking is by Simms-Bosch magneto with small accumulator to facilitate the starting of the motor without leaving the seat. The other models for 1906 are 20, 30, 50 and 75 horsepower. Among the novelties in body work is a landaulet in which an extra seat has been gained by enclosing the front seat to the left of the driver in the rear

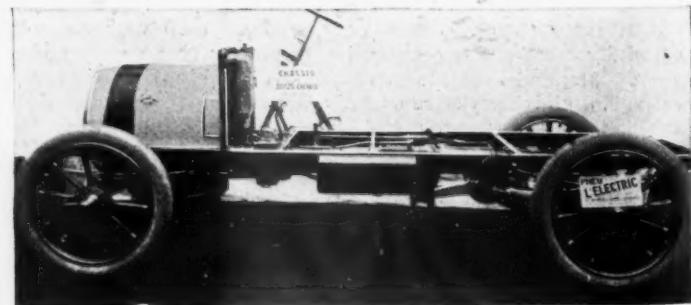
of the car. Thus there are two rear seats and one corner seat inside and one corner seat outside for the driver. The circular seat inside has glass sides and front.

An American firm, the Dolores Co., operating in Paris, has also a town vehicle with driver's seat on the left, controlling levers in the center and steering wheel near the left-hand side. It is a 10-horsepower four-cylinder chassis, one of the lowest power four-cylinder automobiles in the show. The only other exhibit on this stand is a 40-horsepower chassis, the largest size made by this firm.

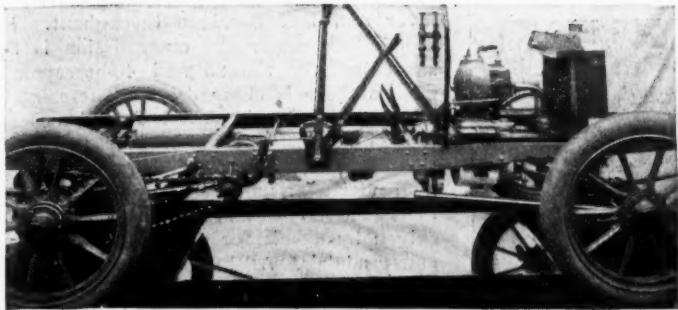
Renault has also brought out a 10-horsepower four-cylinder automobile for town use, the chief novelty the firm has produced this year. The old 10-horsepower two-cylinder model is replaced by an 8-horsepower two-cylinder car. The entire output for some time to come has already been bought up, and Renault is building few cars for the general public.



RICHARD-BRASIER 25-36 HORSEPOWER CHASSIS

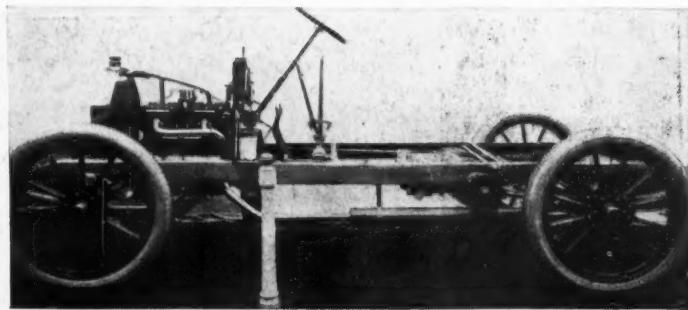


SERPOLLET 20-25 HORSEPOWER CHASSIS



CHASSIS OF THE 1906 PEUGEOT

At the Darracq stand, one of the most elegant in the show, Hémery's Vanderbilt cup racer is exposed and always has around it a big crowd of people. There is a 10-horsepower two-cylinder light car, sliding change speed gear giving three speeds ahead and reverse, with direct drive on the high, and internal expanding brakes on the differential and the rear wheels. Body work on the 10-horsepower car is a double phaeton with side entrance. The 8-horsepower model has a single cylinder and tonneau body with pivoting front seat. Changes have been made in the clutch, a number of spring studs piercing the outer face of the male cone and raising the leather slightly. By this means a progressive drive is obtained. Push forward pedals with a longer leverage have been adopted in place of the old push down pedals. There is a new system of automatic lubrication and there are now no joints in the water circulating system. Other models shown are 12, 15, 20 and 40 horsepower which excite great admiration.



BERLIET 16-22 HORSEPOWER CHASSIS

De Dion & Bouton are showing 8, 15 and 24-horsepower models. Tube side frames are abolished in the 8-horsepower model in favor of pressed steel; there is a single-cylinder motor, three speeds and reverse and metal clutch. Tube side frames are only used on the 8-horsepower model. Greater changes are made on the 15-horsepower car, for the well-known type of de Dion bonnet has been replaced by a square hood permitting the use of a honeycomb radiator. The motor has four cylinders, pressed steel frame, sliding gear giving three speeds and reverse, and patent metallic clutch. The 24-horsepower car, shown with a limousine body, differs from the 15-horsepower car in having four forward speeds.

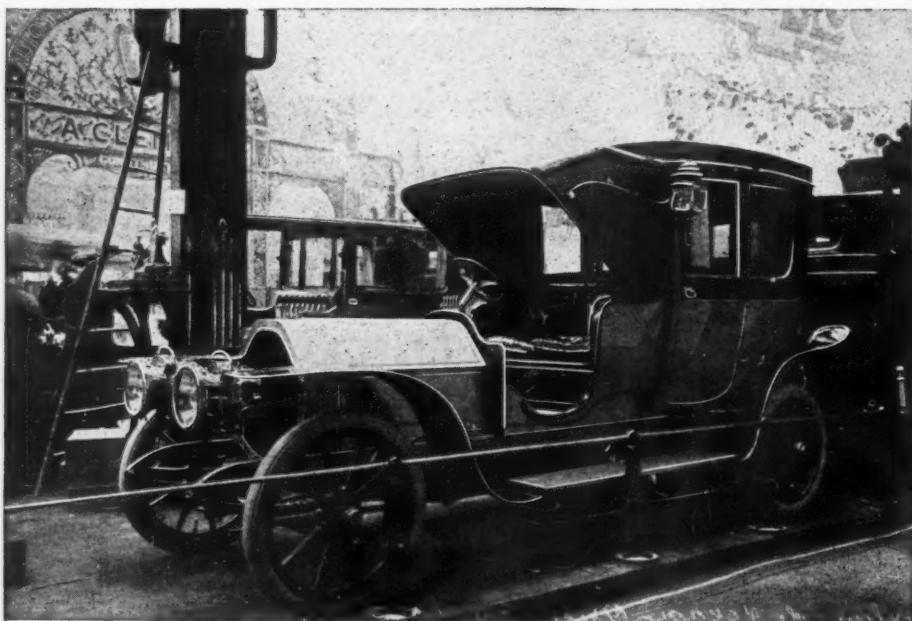
Mors models are 17, 28 and 45-horsepower. A new metallic clutch has been designed for the 17 and 28-horsepower models and flat push pedals, the same as those on the larger car, have been adopted on these two models. An exceedingly powerful compound brake is fitted to the

45-horsepower model. The most interesting feature of the stand is a self-starting apparatus. It consists of an air pump, a patent mixing chamber called a dynamogene, a decompression tap and another for the gas to each cylinder. In addition, the apparatus includes a small lever connected with the taps, and necessary piping uniting the pump, the dynamogene and the cylinders. To start the motor the small lever is drawn over to open the taps, and the pump is worked two or three times. Air is driven by the pump into the dynamogene, where the necessary mixture is obtained. The small lever is pushed back, and on sparking the motor starts instantaneously.

Leon Bollée shows 20 and 40-horsepower models in which minor changes have been made in brakes, oiling arrangements and the enclosure of working parts. A tire pump is shown on a 40-horsepower chassis, attached to the main shaft between the clutch and the gear box, and connected up or disconnected by sliding a sleeve



ONE OF THE MOTOR BUSES USED TO CARRY PEOPLE TO AND FROM THE PARIS AUTOMOBILE SHOW



MAGNIFICENT BODY DESIGN ON THE 30-40 HORSEPOWER ARIES CAR

along the shaft. Some splendid body work by Kellner is also shown on the Léon Bollée stand, the finest specimen being an elegant limousine of an entirely new design, which will be shown at the New York exhibition.

The car which won the Bennett cup excites everybody's interest at the Richard-Brasier stand, as well as the trophy which was held for 2 years by the same firm. In the 1906 model the pistons are increased in length, giving a larger wearing surface, diminishing wear and reducing considerably the entrance of oil into the interior of the combustion chamber, and removing the wrist pins from its upper face where it is exposed to high temperatures. The inlet and exhaust valves are interchangeable and are placed on the same side of the cylinder. The leads from the exhaust are all united and are surrounded with water cooling in order to prevent deterioration of the valve. The

camshafts are strengthened and are in one piece with the cams, thus preventing all differences arising from keying on and giving a more regular distribution. A special form has been given to the crank-case in order to diminish the splashing of oil on the cylinder sides. A self-starting apparatus is fixed on the 15 and 25-horsepower models by which the motor can be started from the driver's seat by the use of a lever on the side of the car.

Some changes have been made in the lubricator, and it is now possible to stop the flow of oil to the cylinders while passing through a town, and thus reduce or abolish entirely smoke from the exhaust. The clutch of the 40-horsepower model allows a greater amount of slipping when starting, but being rigid when running at high speed. This clutch was used on the 1904 and 1905 Bennett racers. The change speed gears are similar to those of 1905, with four speeds and reverse on the same

lever and ball bearings throughout. In the 15-horsepower the transmission is by shaft but for the 25 and 40-horsepower models there is chain drive. There is an increased water circulation for all models, the 15 and 25-horsepower cars being by thermo-siphon, and the 40-horsepower cars by centrifugal pump. The radiator is of the Bennett type and there is a ventilator driven by a belt for the 15 and 25-horsepower models. All brakes have been made larger and more powerful.

Mercedes models are to be made in three sizes—35, 45 and 70 horsepower. The valve camshaft gearing is now of steel running in an oil bath and completely closed in an aluminum crank case. Lubrication is by mechanical pump with positive gear drive. Springs are longer and softer and both foot brakes are fitted with large butterfly adjustment screws. The coiled spring all-metal clutch is entirely enclosed and runs in an oil bath. The most important change is in the gear box and now there is direct drive on the high, while the three lower speeds are operated through but a single set of gear wheels, as on previous models. Features of the body work and fittings on a double phaeton touring car shown at the Mercedes stand are false floor boards fold-

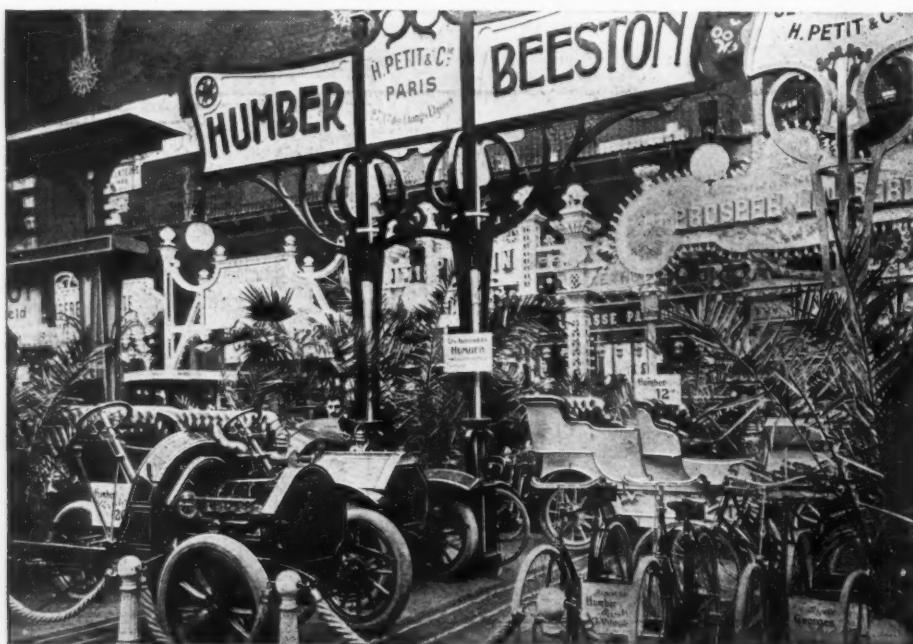


A BENZ CAR OF 1889

ing over to make a sloping floor, side doors opening from back to front, side doors for the two front seats, a new trunk bracket in rear enclosed by a metal sheath following the form of the rear of car, and a swing lantern on the left side of front seats of the car.

Hotchkiss cars are not changed much this year. Ball bearings, first introduced by this firm, are fitted throughout, even on the crankshaft. The 35-horsepower model has had its side-frames lowered 4 inches, weight has been saved on the live axle, at the same time increasing its strength. In the model shown there is a speed box with three sliding sleeves and a change speed lever without springs or ratchet, of such construction that the reverse motion cannot be put in accidentally. A heel pedal has to be depressed before the lever can be put into reverse position. It opens automatically to let the lever out, and then closes again.

Neither Fiat nor Itala has made many changes on last year's models. The former firm shows a 12-16-horsepower chassis intended for a four-seated body for light use. This model, however, does not replace the existing 16-horsepower chassis. The two Italian firms have two of the finest stands in the whole show, both in a cen-

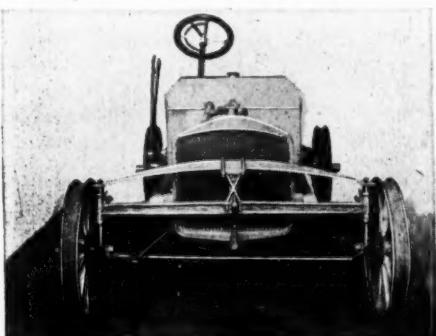


DISPLAY OF THE BEESTON-HUMBER COMPANY

tral position and both gorgeously decorated. The Itala is now represented in Paris by Henri Fournier, formerly sole agent for the Oldsmobile.

In addition to the four American firms—Columbia, Cadillac, Oldsmobile and American Locomotive Co.—exposing automobiles at the Paris show, Rushmore lamps are exhibited by the newly appointed Paris representative, and in the industrial section there is a good show of machine tools by such well known American firms as Brown & Sharp Mfg. Co., Pratt & Whitney, Yale & Towne Mfg. Co., Cleveland Twist Drill Co., and American Emery Wheel Works.

In the Serpollet stand the 1906 models are absolutely new and differ much from preceding types brought out by this exponent of steam vehicles. The generator is in front, the motor in the center and the water reservoir in the rear, making the Serpollet design a perfect imitation of the gasoline machine as far as general disposition of the power plants is concerned. In next year's machines the generators used are very small and the motor a double type, with a pair of horizontal cylinders lying side by side in the center of the chassis frame. Many changes are made in detail around the generator, one



SIZAIRE & NAUDIN'S VOITURETTE

of which is the introduction of a recuperator, by means of which the feed water to the generator is reheated by the escaping steam from the motor.

Two chassis and one complete machine are exhibited by the Ader company. One of them is a four-cylinder 16-20 horsepower, and the other, with the same style of motor, is rated at 20-24 horsepower. They both are noticeable by the strength shown in the frame work, and also in the interior mechanisms of the motor and also in the shafts and gears of the transmission set. The 16-20 horsepower chassis is intended only for city use, the concern having catered exclusively to this line for the past 18 months. Another portion of the exhibit is a limousine-bodied car mounted on the higher powered chassis. This body is commodious in the extreme, having accommodation for six in the rear and for one or two beside the driver on the exposed front seat.

Pilain cars in three different chassis lines are shown—16-22, 20-30 and 24-35 horsepower—and a special model 40-60 horsepower. All of these models are similar in that they have four vertical cylinders. As for the 20-30 horsepower machine its construction is very strong and it is furnished with a special carburetor,



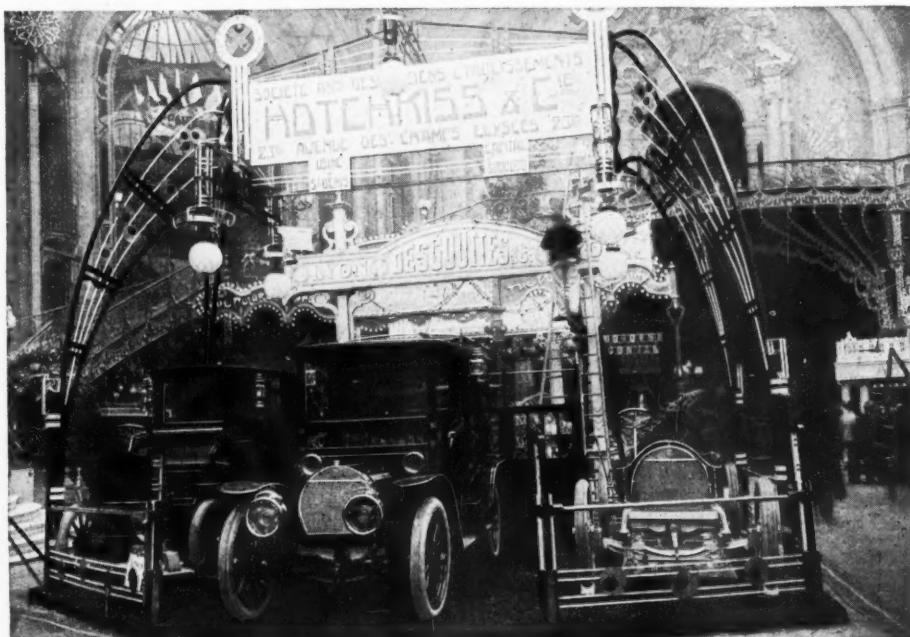
BIG EXHIBIT OF THE DELAHAYE CARS

in which the air-controlled valve can be manipulated from the steering wheel when desired. Other points deserving of attention in this machine are the strength of the rear wheels, brakes, the use of an adjustable positive oiler and the adoption of transmissions giving either three or four forward speeds as desired by the buyer. In the 40-60 horsepower machine, the motor is unique and the gear set differs from others on exhibition in that it has three direct speeds ahead.

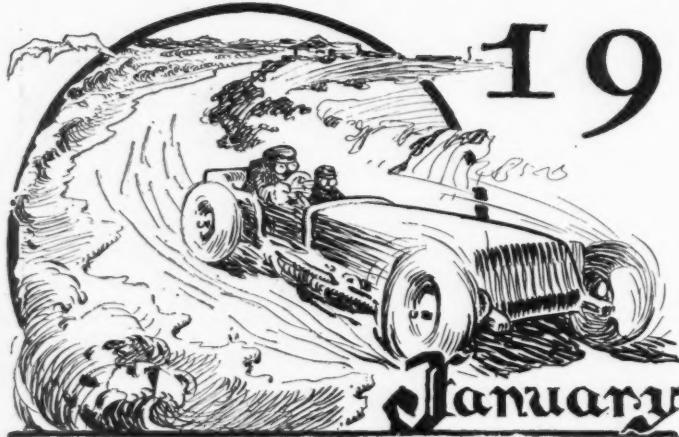
Four new Florentia models are exhibited on the concern's stand in the center of the hall. One is an 18-horsepower four-cylinder machine with magneto ignition, metal-to-metal clutch and final drive from the gear set to the back axle by cardan shaft. The gear set gives four speeds ahead, the top one being direct drive. Gasoline is fed to the carburetor by air compression, three brakes are used and the tires are large. A chassis similar

to this uses final chain drive. The 24-horsepower chassis is of the four-cylinder type and has ignition by a low-tension magneto, with make-and-break devices within each cylinder. The clutch in this model is of the metal-face variety. It has four speeds ahead and all minor points about it are similar to those in the 18-horsepower machine. In the 50-horsepower machine low-tension magneto ignition is fitted. It has four forward speeds, metal clutch and chain drive.

Two chassis are exhibited by the house of Bruhot, one a 12-horsepower machine with a three-forward speed transmission, another a 15-horsepower chassis and the third of 60 horsepower has a gear set with four forward speeds. All models are of the vertical four-cylinder variety. Cooling is by a positively-driven water pump. Magneto ignition is fitted, and the lubrication of the motor and motor bearings is by a mechanical oiler.



HOTCHKISS & CO.'S SMALL BUT IMPRESSIVE DISPLAY



1905

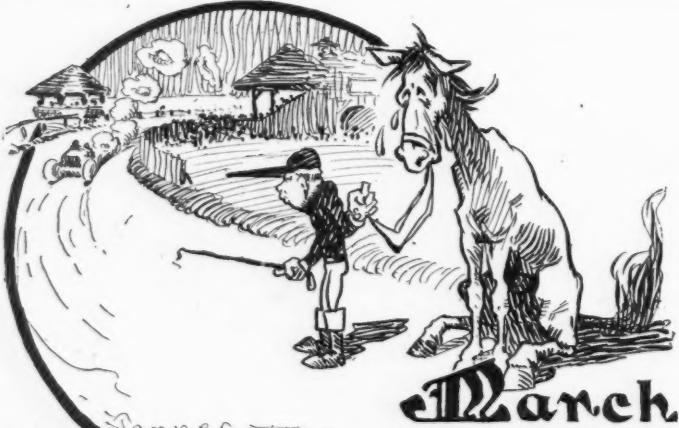
January

Automobile Club of France chooses Auvergne course for 1905 Bennett cup race.
A. A. A. racing board refuses to recognize Kiser's Cleveland mile of 52 4/5 seconds and Oldfield's Denver mile of 51 1/5 seconds.
New York show is held in Madison Square garden.
Association of Licensed Automobile Manufacturers secures Madison Square garden for show purposes.
Annual meet, held at Ormond, Fla., results in mile in 32 4/5 seconds by Bowden, kilometer in 20 3/5 seconds by Bowden, 50 miles in 38 minutes 54 seconds by Fletcher and 100 miles in 1 hour 18 minutes 24 seconds by Fletcher.



February

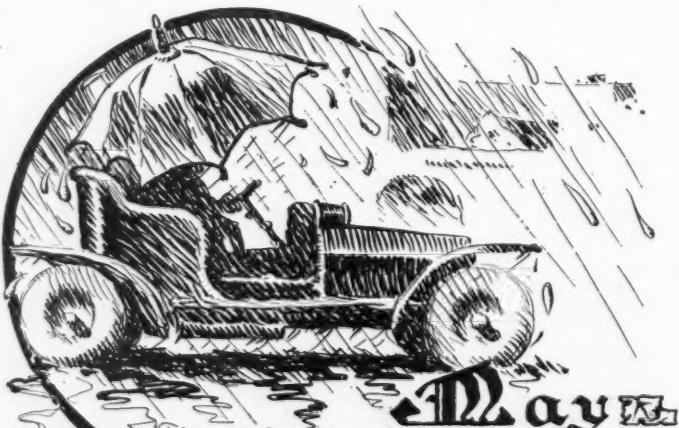
Automobile Club of France declines to separate Bennett and grand prix events.
Chicago automobile show held in Coliseum, 100,000 people attending during week and \$7,000,000 worth of goods sold.
Kaiser Wilhelm assists in opening of Germany's annual show in Berlin.
First road race run in Cuba won by E. Carricaburo, driving for E. J. Conill.
World's standing start mile record cut to 45 seconds by H. W. Fletcher in 80-horsepower de Dietrich, at Havana, Cuba.
France decides to run Bennett and grand prix events separately.



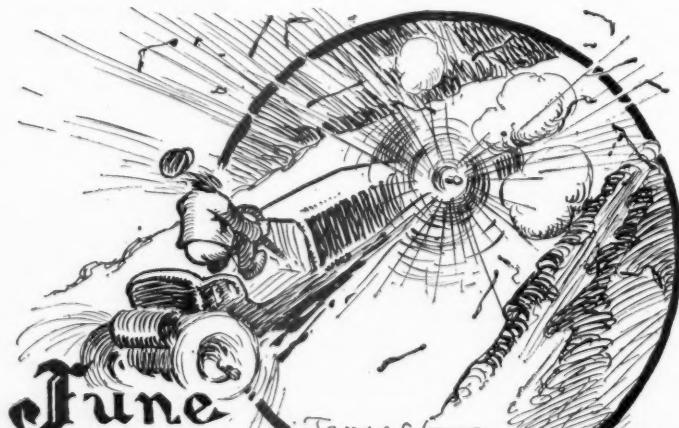
American Motor Car Manufacturers' Association formed by makers not in A. L. A. M.
Independent makers decide to hold show next year and not leave field exclusively to A. L. A. M.
E. H. Cutler elected president of National Association of Automobile Manufacturers.
R. L. Morrell selected as chairman of A. A. A. racing board and A. G. Batchelder as secretary.
Morris Park, historic horse racecourse, given exclusively to motor car racing.
Automobile Club of America cuts into show game.



Labor system of road building condemned by Buffalo's good road convention, which favors \$50,000,000 bonds for road building.
Date for Bennett cup race set for July 5, and French eliminating trial for June 16.
Racing board of American Automobile Association defines amateur and professional racing, and passes important racing regulations.
Australia's first endurance contest won by a 10-horsepower Argyll car.
Plattier, driving a 22-horsepower Berlitz, wins French reliability test of Automobile Club of France, Marseilles capturing team race run in connection with it.



Grout steamer makes fastest time of day in Springfield, Mass., hill climb.
Second annual parade of Automobile Club of America in New York run over muddy streets, 130 cars taking part.
Wriggway, in a 24-horsepower Peerless, lowers 1,000-mile non-stop record to 25 hours 50 minutes 1 second.
Dwight Huss and Percy Megargel start on Oldsmobile transcontinental trip.
Thirteen nominations made by America for Vanderbilt cup race.
Louis Chevrolet cuts mile track record to 52 4/6 seconds at Morris Park.



Webb Jay's defeat of Barney Oldfield and Louis Chevrolet a feature of Chicago's 3-day meet.
Guy Vaughn, in Deauville, breaks Wriggway's non-stop and 24-hour records at Empire City track.
Mercedes car makes best time climbing Dead Horse hill, Worcester, Mass., and Grout steamer beats all other American cars.
Earp, Napier, and Bianchi and Rolls, Wolseley, selected as British representatives in Bennett cup race, with Hargreaves and Cecil Edge, Napier, as alternates.
Thery, Richard-Brazier, Caillols, Richard-Brasier and Duray, de Dietrich, make French team for Bennett cup race.



July

Leon Thery, France, wins Bennett cup for second time, covering 340 1/2 miles in 7 hours 2 minutes 25 seconds. Nazaro, Italy, second; Cagno, Italy, third; Caillols, France, fourth. Lytle only American to finish. Tour from Chicago to St. Paul comes off, roads being muddy and weather rainy. Webb Jay, in White steamer, does flying mile at Morris Park in 48 4/5 seconds. W. H. Hilliard, in a Napier, is hero of Mount Washington hill climb, reducing record to 20 minutes 58 2/5 seconds. Glidden tour trophy is won by Percy P. Pierce, in Pierce Great Arrow.



August

Barney Oldfield injured in accident at Detroit, caused by smashing into fence during 5-mile race; injuries not serious. Hemery, in a Darracq, wins 600-kilometer race over Ardennes circuit, in 5 hours 58 minutes 32 1/5 seconds. Earl Kiser meets with serious accident at Cleveland, injuring left leg so amputation is necessary. Webb Jay receives almost fatal injuries in race at Buffalo. Official awards in Herkomer tour in Germany give trophy to E. Ladenburg, of Munich, in a Mercedes, fitted with Continental tires. Track racing practically abandoned because of accidents to Jay, Kiser and Oldfield.



September

Pope-Toledo, Locomobile, Tourist, Haynes and Thomas cars finish in order named in American eliminating Vanderbilt cup trial, but commission rejects third, fourth and fifth cars, substituting White, Christie and Lytle Pope-Toledo; Dingley drives winning machine, averaging 56.2 miles per hour. Tourists' trophy race, England's big automobile contest, is won by Arrol-Johnston car, fitted with Continental tires. Sorel, in a De Dietrich car, winner of Pyrenees cup tour in France. Raggio, driving an Itala, captures race for Florio trophy in Italy; twenty-one cars start. Burrelle tire trophy commission awards cup to the Continental tire.



October

France lifts Vanderbilt cup, with America second, Italy third and Germany nowhere; Hemery is winning driver, Heath being runner up; accident robs Lancia of almost certain victory. Hemery's time, 4 hours 36 minutes 8 seconds. Clifford-Earp, in English Napier, wins Chateau Thirry hill climb in France, average speed being 58 miles an hour; he also captures honors at Dourdan meeting. James Gordon Bennett denies story he has given his cup to Italy for touring competition. Braun scores his third consecutive victory in Semmering hill climb in Austria.



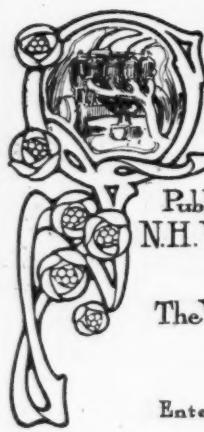
November

English shows are held, Olympia at Olympia hall and Stanley at Agricultural hall; French makers well represented. Reo omnibus wins economy test of New York Motor Club, with Reo runabout second. Glidden tour committee decides to start next year's run from Buffalo, route going through Canada and White mountains and ending in New York city. Coliseum show in Chicago so big Manager Miles is forced to secure First Regiment armory as annex. Records broken by National car, Clemens and Merz smashing Vaughn's marks from 650 to 1,000 miles as well as 24-hour record.



December

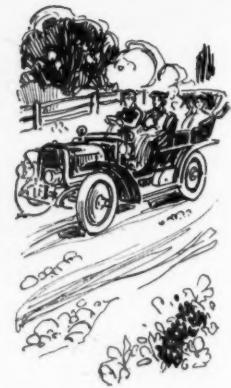
Largest automobile show on record held in Paris. Vandals strew nails on course on last day of French runabout test, making it impossible to immediately pick winner. Pyrenees cup is stolen from de Dietrich exhibit on last day of Olympia show; no trace of it to be had. Congressman Morrell, of Pennsylvania, introduces bill into house of representatives which seeks to compel tourists to take out federal licenses. Independents' tire company, the Ajax Standard Rubber Co., organized, the plant to be at foot of East One Hundred and Sixth street, New York; Horace de Lisser, organizer.



MOTOR AGE

309 Michigan avenue, Chicago

Published every Thursday by the Trade Press Company
N.H. Van Sicklen Manager - Chas. P. Root Editor
Subscription two dollars a year
Foreign subscription four dollars
The Western News Company of Chicago and its Branches
supply newsdealers
New York office 29 West Forty-second street
Official Organ of the American Motor League
Entered at the Chicago Postoffice as second class matter



THE HORSE AND THE AUTOMOBILE

THIS is a story about the most dangerous animal in the world—a creature which annually kills and maims more human beings than are slain or injured by any other beast. * * *

Yet, of all accidents to human beings, fatal or disabling, including mischances of every kind and description, not less than twelve per cent are caused, directly or indirectly, by this fear-inspiring creature. Just think of it—twelve out of every hundred mishaps involving physical injury more or less serious! These are official accident-insurance figures. * * *

Assuming that horses cause twelve per cent of them, it appears that these animals are accountable, directly or indirectly, for about 780,000, or say three-quarters of a million, more or less serious mishaps in the United States every year. If these mischances result fatally in only 1 per cent of all cases, the number of deaths annually in this country, attributable to horses, cannot be far from 8,000.

The chief cause of horse accidents, however, lies in the fact that this noble animal—beautiful, docile, affectionate; man's faithful friend and patient servant—is born a fool, and never gets over it. Its intelligence is overestimated. * * *

One of the accident-insurance companies recently published a statement, based upon its own returns, which showed that out of a hundred average accidents caused by the horse, the railroad, the automobile and the bicycle, eighty-two are attributable to the equine brute, nine to the railroad, five to the motor car, and four to the silent wheel. One reason why physicians are rated as bad risks is that they use horses so much for driving about—an idea the justice of which is indicated by the fact that, out of 972 accidents to doctors recorded by another concern, 267, or considerably more than one-fourth, were due to horses. * * *

Next in the scale of hazard after the ice wagon comes the express wagon. * * *

The only vehicle rated as more dangerous than the ice wagon is the newspaper delivery wagon, which is considered such a hazardous risk that most of the companies regard it as practically non-insurable. * * * Fast horses are used, and the driving is utterly regardless of the lives and limbs of pedestrians. * * *

A discussion of dangers attributable to horses would be incomplete without some reference to the fact that they are responsible for the existence of the multitudes of house-flies which, apart from the discomfort they cause in summer, are known to be carriers of disease germs. Every stable in warm weather is a fly factory, in active operation night and day. * * *

Meanwhile let us acknowledge that the horse, after all, is the most useful of all animals to man, bar none, and that if, owing to its timidity and lack of cleverness, it is a cause of many serious and not a few fatal accidents, the services it renders to the human race are so extremely valuable as to compensate many, many times over for all the mischief it commits.—René Bache in Saturday Evening Post.



THIS is a story about a machine that is not gifted with brains, but which is accused of more deviltry than any known animate or inanimate thing—chiefly because it is something comparatively new.

The automobile has been responsible for some deaths—but the majority of its victims have been the drivers of the automobile itself. And even admitting all this, it is shown elsewhere that the percentage of accidents caused by the automobile is less than half the percentage of deaths caused by the horse.

While the horse is held responsible for 8,000 deaths each year, it would be a difficult task for the most clever statistician to compile a table showing that automobiles have been responsible for more than a hundred deaths in a year—and this in every country on the entire globe.

The automobile is not born a fool, but it is sometimes placed in the hands of a fool. But horses are also placed in the hands of fools, and the fool driving and the fool being driven make a dangerous combination.

Eighty-two per cent of accidents attributable to the horse! Five per cent of the accidents attributable to the automobile!! Here the estimates of the motorphobists are sadly shattered, and the need of legislation to govern the users of horse-drawn vehicles becomes apparent. On this basis what chance in a lifetime has a man to be injured by a motor car? The motor car will not run away if left alone; it is the most harmless thing on earth then. And even when it is being operated it is usually in the hands of more competent people than are horses, which are frequently driven by small boys and girls.

René Bache has forgotten the deadly trolley car—everybody knows its record for death and destruction.

The paragraph opposite is a deathblow to the motorphobist press. While the enterprising press is making every endeavor to rush its papers through a city's streets, mindful of the life of no person, it is at the same time doing stunts in journalism to show how dangerous to life and limb is the motor car.

Automobiles are not responsible for flies; they do not make barnyards of the streets; they do not breed disease, and they are not taken to rendering establishments to be ground into something for man to use. But the day has come when a city's streets are no place for the poor horse, where it may tear itself to pieces stumbling over slippery and stone-faced pavements. The horse is too nice a brute to be subjected to such abuse. It ought not to be a part of a city's life.

The horse IS useful and it has its place. Furthermore, the horse has been done an injustice to some extent in that it has been classed as brainless. As a matter of fact, but for the horse sense that exists in the horse and the brains that do not exist in many drivers—and drivers as a rule are not over intelligent—there would be more accidents caused by the horses than there are at the present time.





The good roads fever is again epidemic, and in some places even the rural districts have been attacked.

While some automobile makers will proudly turn over new leaves, others may feel justified in turning back a few leaves.

Fitzsimmons might break into the automobile game and procure a job as chauffeur—he's still good enough to wallop road hogs once in a while.

It doesn't take a wooden Indian to discover that four-cylinder automobiles are becoming quite the thing in this country, and that other types are gradually becoming extinct.

The purchaser of a French automobile probably wonders how much of his good coin went to fitting up the Paris salon and the magnificent decorations around the stands of most of the manufacturers. No wonder foreign automobiles come high.

About the time France heard of the evident success of the 1906 Florida beach tournament—with the possibility of a few records being broken—it reconsidered its determination not to hold a big race, and is now after all the advertising it can give its makers.

Now the American Automobile Association is stirred up because its own representatives at the Paris conference did not know under whose auspices the Vanderbilt cup race was run. It might be suggested that this is the penalty for naming dummies to serve as representatives.

Getting lost in a snow storm, having one's car frozen to the ground, staying out on a prairie all night and going without food for 36 hours is a part of motoring experience which few desire, but which transcontinental tourists seem compelled to take. While not at all pleasant at the time, it makes good story-telling material, if that is any consolation.

One Frank Mudd, of Chicago, has taken pains to orate and to glory in paying a fine for exceeding the speed limits, because he has at other times received the full value of the money paid out in doing a little searching when the police were not in sight. It is bad enough to break laws without boasting of it, but to say a judge is misguided and narrow minded is, at least, discourteous. There is some consolation in the fact that Mudd represents no automobilists other than himself and that few automobilists in any manner coincide with him in his rantings or intend following his lead.



The fantastic headgears seen at the Paris automobile salon suggests that even the French women have automobiles on the brain. Let it be hoped no such affliction shall befall this country.

Congratulations are extended to the two Chicago automobile dealers who have waxed hot for a week or so over the proposition of the speed of the car handled by one of the dealers. It requires some fine scheming to work a metropolitan daily paper for priceless reading matter.



Charges of mismanagement of Vanderbilt race, made at international conference in Paris, stir up Americans.

Prospective entry list for Ormond-Daytona meet shows most of the stars of the world in the competition.

At least ten entries expected for the Cuban road race: Americans in Havana subscribe to fund to run race.

Court of common pleas refuses request of Automobile Club of Philadelphia to enjoin city from enforcing tag law after first of year.

Unintentional action of Minnesota legislature may knock out the new highway commission in gopher state.

Philadelphia dealers decide to get together and fight the grafting chauffeurs.

Rules of Tourist trophy race altered so steamers get in on special fuel allowance, equivalent to about 16 miles per gallon.

In big French road race next year drivers will have to repair own tires and mend breaks in machine, no outside help being allowed; tire race sidetracked by grand prix, which will probably be held over Fontainebleau course.

Observations from Paris automobile show.

The English makers didn't seem to think much of the Paris show—which probably is a little in the line of retaliation.

English motorists have an opportunity to demonstrate to the politicians of their country that in union there's strength.

All this hub-bub about Florida and all the silence on Senator Morgan's part would indicate that the meet and not the senator is being advertised.

Although he doesn't know it, the automobile is the horse's best friend; it is the automobile that is to take the noble brute out of bondage and do away with humane societies.

What's the matter with the A. L. A. M., the N. A. A. M., and all the other alphabetical associations getting together and erecting a building on a 40-acre tract to be used for the annual automobile show?

With due consideration and respect for our own greatness and our own ability to hustle, we'll have to go some to even approach Paris in the matter of grandeur as far as automobile shows are concerned.

The American automobile community is pouring out its thanks to the good, kind weather man for the quality of winter he has been dealing out; but the probabilities are he will receive his full share of cussing before another month shall have passed.

As usual, a few slow ones have just heard that automobile shows are to be held in New York and Chicago in January and February, and are clamoring for space. What would these particular makers do if the shows were to be held in November or December?

As if automobilists didn't have enough in the trouble line, they have the grafting chauffeur with which to contend. He has been making his presence felt in every city in the union, and the fact that he is to have his fingers burned by the Philadelphia Automobile Trade Association will be welcome news to the automobile fraternity.

It's nice of Chicago's exponent of motorphobia, the Tribune, to devote a fifth of a column of space to half a dozen accidents—three of which were caused by railroad trains or trolley cars and were fatal—and cover the same with a flare head telling of an automobile accident whereby the automobile merely knocked a man down, and the victim admitted the automobile was in no manner to blame. This is enterprise.

BIG TEMPEST IN RACING TEAPOT

Criticisms of Foreigners Over Conduct of Last Vanderbilt Event Stirs Up Storm in New York—American Officials Reply to Assertions, Showing Germans Were Not Posted

New York, Dec. 23—Mingled indignation at the charges and amusement at the utter ignorance of the true conditions not only by the foreigners, but by the delegates representing the Automobile Club of America have followed a cabled story of a discussion that occurred during the progress of the recent conference of clubs belonging to the international union. The story of the discussion alleged to have taken place at the meeting is quoted as follows:

"Count Sierstorpff, representing the German Automobile Club, said he wished to draw the attention of the meeting to some irregularities in connection with the Vanderbilt cup race. Germany had entered five machines for the contest and the German club was anxious to have a representative on the Vanderbilt cup commission to look after the German interests. He wrote to the American club on the matter, but the only reply he received was a list of members and the intimation 'this is the committee.' He wrote again, giving his reasons for desiring German representation, but he received no answer. He also wished to remark that the committee refused two of the machines entered by Germany and nominated two other German machines without consulting the German club in the matter.

"In reply Howard Johnstone and W. S. Hogan, as representing the American club, said they had heard nothing about the matter up to then, but promised to bring the matter before the governors of the American club at once.

"Baron de Zuylen then set the whole committee laughing by remarking that though France had won the Vanderbilt cup twice, the French club never had been able to get hold of the trophy, though repeated demands had been made. He thought this rather hard on the French automobile club.

"De Knyff caused some sensation by saying he had reason to believe some very irregular proceedings had taken place in connection with the Vanderbilt cup race itself. He had heard the weighing-in went on until midnight when all the officials had gone away, and that the third machine to be placed in the race was using a Krebs carburetor, which, of course, was of French construction. Messrs. Johnstone and Hogan simply replied that they were unaware of the facts and that they would at once report the matter to the American club."

The real incidents and circumstances are familiar to all followers of racing, and, very largely, to the general public in this country, every detail of the conditions, preliminaries and conduct of the race having been repeatedly printed in the stories previous to, and following the race. They are comprehensively covered by the replies of Chairman Morrell, of the racing board; Secretary Butler, of the A. C. A., and E. T. Birdsall, of the American Automobile Association technical committee.

"In the first place," said Mr. Morrell, "the deed of gift prevented the adding of a German representative to the commission. In the second place, no entries of German cars were declined. The entries of the machines of Baron de Caters and the late Mr. Dinsmore were withdrawn.

"A date had been set for the designation of drivers and particulars of machines and up to that time it was possible to make changes in entries. The de Caters nomination was withdrawn before that time and the Mercedes car of S. B. Stevens, of Rome, N. Y., was substituted by the commission in the belief that the entry would be acceptable to the German club. As a matter of fact a cablegram confirming the entry was received by the secretary of the Automobile Club of America on the day following.

"Upon the withdrawal of Mr. Dinsmore's car H. L. Bowden, of Boston, offered to substitute his Mercedes racer, but as that was subsequent to the date set for the designations of drivers the offer was declined. As to the whereabouts of the cup, I was under the impression that it was in the possession of the French club.

"The charge that weighing-in was done without the presence of officials is untrue. Because of the delay incurred in the substitution of new cylinders the Locomobile racer was taken to the scales at half-past 10 o'clock on the night before the race. E. T. Birdsall, technical member of the commission, in charge of the weighing, was present at the time. I would have held the scales open for any of the cup cars, foreign or American, all night if it had been necessary.

"The charge that a French carburetor was used on the Locomobile is equally groundless. I examined the Locomobile racer thoroughly and its carburetor was a duplicate of the one used on my own Locomobile touring car, and which I know to have been made in Bridgeport, Conn.

"It is regrettable that these charges have been made without a knowledge of the facts. It is the first unpleasant incident in connection with the most successful automobile race ever held in this country."

"Concerning the correspondence with the German club," said Secretary Butler, "our club simply acted as an intermediary for the American Automobile Association. We sent a list of the Vanderbilt cup commission to the German club, and apparently that was what Count Sierstorpff had reference to when he said he received a club membership list by way of answer to his demand for German representation on the committee.

"It is unjust to hold the automobile club accountable for something over which it has no control. The deed of gift from W. K. Vanderbilt, Jr., places the cup in the custody of the American Automobile Association, and designates a commission to take over active control of the

race. This commission consists of the racing board of the American Automobile Association, the chairman of the sports committee of the Automobile Club of France and the donor of the trophy, Mr. Vanderbilt. Under such deed it would be impossible to place a representative of the German club or of any other foreign club on the committee.

"With the answer of our club to the German club's inquiry was mailed a copy of the deed of gift. The correspondence was then turned over to the Vanderbilt cup commission. As to the Vanderbilt cup, I believe it was placed in a vault at Tiffany's to await orders from the French club. If that organization has not possession, it probably is due to another misunderstanding. As a member of the commission I know that no German entry was declined, nor was any entry filled in the German team without the consent of the Automobile Club of Germany."

E. T. Birdsall, technical member of the commission in charge of the weighing-in of the cup cars, emphatically denied that any of the machines had been weighed without the presence of the officials as had been intimated by Rene de Knyff, of the French club. He also denied that the American Locomobile racer was equipped with a French carburetor.

"I was present at the weighing of every cup car," said Mr. Birdsall, "and I personally made a minute inspection of every machine that competed in the race. The Locomobile, owing to the delay in substituting new cylinders, was not weighed until 1:30 o'clock on the morning of the race.

"There were present at the time A. L. Riker, of the cup commission; S. A. Miles, representing the manufacturers' association, and several other race officials. We had gone on the scales at 10:30 o'clock at night expecting the car to be ready then, but we waited until it was actually in readiness to compete before we placed it on the scales.

"The statement that a Krebs carburetor was used on the Locomobile is not borne out by the facts. The carburetor used was of the regular stock type used on all Locomobile machines, and manufactured at Bridgeport, Conn. There is actually no doubt of this, as I personally examined the carburetor, as I did all other parts of the machine."

The evident ignorance of the foreigners participating in the discussion of racing conditions here is evidenced by their confusion of the Automobile Club of America and the American Automobile Association. That Howard Johnstone and W. H. Hogan confessing to practically no knowledge whatever of the circumstances connected with the winning of the Vanderbilt cup, should have been named by the A. C. A. as quasi representatives of the United States in an international conference having to do with racing is, to say the least, amazing. Mr. Johnstone, the club's foreign representative, has been fully informed of the correct facts of the case by mail and has been requested to present them to the German and French clubs.

"If any of the foreign clubs which competed in the Vanderbilt race," said President Morris of the A. C. A., "had

any complaint to make as to its conduct by the American Automobile Association such complaint should naturally have been made at the time of the race and in accordance with the rules. It hardly seems fair or sportsmanlike to make such complaints at this late date, more than 2 months after the race has been run."

For awhile the New York motoring world was agog with excitement, but when it was discovered the criticisms were made through ignorance of the situation everyone calmed down.

ABOUT NEW YORK ARMORY

New York, Dec. 25—The new armory of the Sixty-ninth Regiment, where the A. C. A. show will be held, is an immense assembly hall, altogether without an architectural parallel, its design and construction being marked throughout by departures from established practice, departures necessitated chiefly by the several requirements of large and unobstructed floor space, ample light, and complete fireproofness. To these ends the main portion of the edifice consists of an enormous drill hall with floor space 189 by 202 feet, housed under a gigantic cabled covering, which is sustained by six semi-circular steel arches. The height from the floor measures under the arches 100 feet. An ample basement extends under the entire building, except under the unexcavated middle portion of the floor of the main hall, under which there is no basement, except around the edges. Around the edges of the main floor, at a sufficient height above it, and with no supporting pillars to obstruct the floor, there is an ample gallery for the accommodation of visitors. For the purposes of the automobile show, this gallery, which nominally is only 16 feet wide and is terraced by rows of seats, is being widened to 18 feet and floored over with level planking. The main floor likewise is being planked over with hardwood. The total floor space available for the automobile show is 152,500 square feet, an amount exceeded by but a few buildings in the world. The outside dimensions of the building are 197 feet wide on Lexington avenue, 305 feet deep on Twenty-sixth street, and 335 feet deep on Twenty-fifth street, running back to within 100 feet of Fourth avenue. The height is 116 feet. Construction was commenced on December 21, 1903.

HEMERY'S RACING CAR

New York, Dec. 25—"I heard not overmuch racing talk and no discussion whatever of the future of the Vanderbilt cup," said a tradesman just back from Paris. "Over there makers seem to think they have learned all that is possible from racing, and believe that if it be continued it will be merely as a sport. I saw Joe Tracy. He was making notes of all the cars, but said nothing to me about being commissioned to buy a racer. The only racer I heard spoken of as a candidate for Ormond honors was the Darracq. I was told that two engines of the type and power used in Hemery's car, which, I am sure, are over 80 horsepower, were to be coupled. I was also informed that the rules as to brakes, reverse and differential were to be complied with in building it."

MANY ON ORMOND LIST

Probabilities Show Morgan Will Have Cream of Racing Talent at His Meet in Florida

New York, Dec. 25—With all this talk of the Ormond-Daytona meet Senator Morgan says intending nominators do not want to forget that the entries will close positively on January 8, with him at his office, 116 Nassau street, in this city.

"I do not propose," says he, "to give out the entries piecemeal, as they come in, but will reserve the announcement of the nominations until after the final closing of the entries."

At the present writing it would seem that the entry of the following were assured: Alfred G. Vanderbilt, 200-horsepower Special, Sartori driver; G. W. Young, 110-horsepower Fiat, H. W. Fletcher driver; Hol-Tan Co., 110-horsepower Fiat, Lancia driver, and 90-horsepower Fiat, Cedrino driver; F. A. LaRoche Co., 180-horsepower Darracq, probably Hemery driver; Charles Schroeder, 80-horsepower Darracq, driver not named; Foxhall P. Keene, 120-horsepower Mercedes, Keene driver; American Napier Co., 120-horsepower Napier, Clifford Earp driver; Dr. H. E. Thomas, 90-horsepower Locomobile, owner driver; Walter Christie, 100-horsepower Christie, owner driver; Renault Brothers Agency, 90-horsepower Renault, Bernin driver; Ford Motor Co., 105-horsepower Ford, Henry Ford and Frank Kulick drivers; C. A. Coey, 90-horsepower Thomas, Coey driver; R. M. Palmer, 50-horsepower Matheson, Palmer and W. H. Owen drivers; Oscar Lear Automobile Co., 50-horsepower Frayer-Miller, Lee Frayer driver; Wayne Automobile Co., 50-horsepower heavyweight and 40-horsepower middleweight Wayne, Holmes driver; White Sewing Machine Co., White steamer, Walter White driver; Louis Ross, Stanley steamer, Ross driver; R. E. Olds, 30-horsepower Reo middleweight, Dan Wurgis driver, and National Motor Car Co., 60-horsepower National, Carl Fisher and Jap Clemons drivers.

Andre Massenot, of the Panhard & Levassor American branch, is expected back tomorrow from an inspection of the Florida and Cuban courses. That they will pass muster goes without saying. The outcome, it is believed, will be the entry of George Heath and a Panhard at both Ormond and Havana.

E. J. Conell, president of the Cuban Racing Association, who sailed for Havana on Saturday, stated he had assurances which led him to believe there would be at least ten crack cars and drivers to enter for the cup contest. As was told in MOTOR AGE last week, the start in the big race on February 11 will be from Camp Columbia, the headquarters of the American army during the occupation. It is proposed to convert the buildings into a training camp with garage, repair and sleeping accommodations. The American Club of Havana is taking great interest in the coming carnival, and subscriptions to its fund have reached \$3,000. The Westrumite Co., of Chicago, has made a bid to oil the 57 miles of course for the \$5,000 appropriated by

the municipal council for the purpose. W. J. Morgan, manager of the carnival, was to have sent out the entry blanks on Saturday, together with those for the Palm Beach motor boat regatta, for which he says he has already received assurances of the participation of five fast boats.

The Fiat team will be the first on the Ormond-Daytona beach. Tomorrow Harry W. Fletcher, with George W. Young's 110-horsepower Fiat, which Lancia drove in the Vanderbilt race, and Emanuel Cedrino, with its mate, which was piloted by Nazaro, start for Florida. Their idea is to experiment with various sprockets and study atmospheric conditions.

RIKER ON FRENCH SHOW

Bridgeport, Conn., Dec. 20—A peripatetic MOTOR AGE man had the good luck to be at the Locomobile factory to-day on the arrival home from the Paris show of A. L. Riker, a pioneer American designer, whose recent triumph in the Vanderbilt race is still fresh in the minds of motorists. That the golden opportunity for an interview on the European 1906 output was seized goes without saying.

"The 1906 models," said Mr. Riker, "show practically no changes. The European makers seem at last to have arrived at a final type. The changes are merely in refinements and details. While propeller shaft drive is employed on the small cars, not one in forty of the big cars has other than double chain drive. Make-and-break spark and magneto ignition are now universal in the big cars. The popular powers are 24 for the low-powered and 40 for the high-powered cars. You must remember, however, that, owing to the tax per horsepower no higher powers are being brought out there. A 24 means 30-35 and a 40 will reach 50-55. The Mercedes is 45-horsepower. No higher powers are being built except for racing purposes. All cars above this are reckoned as mere freaks."

"I was disappointed in seeing so few radical changes. The bodies are smaller than last year and have fairly low backs. The king of the Belgians type has been utterly abandoned. Perhaps because of its being winter, the show cars were mainly of the limousine type, though closed cars with adjustable windows are the prevailing touring type in Europe. We have the European makers skinned to death in body building, both as to finish and workmanship."

"The makers with whom I talked confessed that the days of the European car as a big factor in American trade and sport were numbered."

OF COMMERCIAL INTEREST

London, Dec. 15—A point of considerable interest to British motorists, especially to the trade, has arisen out Bristol way, where a road carrying company, employing steam motor tractor, has been asked to pay more taxes by the Local Road Authority for "extraordinary traffic damage" alleged to have been caused by the company's motor tractors. As this case, if decided against the motor carrying company, would constitute a precedent for a number of similar claims all over the country, the Society of Motor Manufacturers and Motor Union have decided to stand behind the concern.

AGAIN ON THE TRAIL

Megargel Makes Light of His Experience at Flagstaff and Tells of the Adventure

Flagstaff, Ariz., Dec. 19—When we pulled out of Williams in the Reo Mountaineer we fully expected to make Flagstaff by midnight of the same day, having purposely delayed the start until the ground froze, as the mud made going almost impossible. After 4 miles on the low speed we decided to camp out for a few hours and wait for the ground to freeze. This we did, building a bonfire and lying wrapped in our blankets until midnight. Then the car was frozen fast to the ground, and we had to use an axe to chop it loose. Everything went well until we came to the big swamp, and here we became confused in the darkness and ran into a bog, miring the car to the body. We planted post after post to which to attach our cable, but each one pulled out, and it was daylight before we were free and ready to go.

After partaking of a cup of coffee and baked beans, we proceeded eastward, making the best of the hard running through the woods and snow. Soon it became necessary to shovel a road, as the snow was over 2 feet deep and held us fast. I think we did not make 4 miles all day Sunday, and we were traveling a road that had not been broken since the big snow storm of several weeks ago. We hadn't seen a human being since leaving Williams, and our provisions gave out. We had not considered it necessary to lay in much of a stock for the 34-mile run, which we expected to make in a couple of hours. We had gone hungry before, but the cold was intense, and all day Monday it snowed and blew until we couldn't see a half dozen yards before us. Then our gasoline gave out and we were right in the midst of the biggest drift yet found on the trip.

After a consultation we decided to make for the railroad track by compass and follow that to the nearest telegraph station. This we did, reaching Bellemont, 14 miles below Flagstaff, just as a relief party, coming to our assistance, came in sight. We wired Williams for gasoline, accepted the food brought us and, refusing to be towed into town, followed the tracks of the big wagon. The relief party, as much in search of a young ranchman named Smith as us, found his frozen body lying against a log near where we were discovered. He had been dead for several days.

Although our supply of food was insufficient for wintering in the mountain, we killed some small game, which we cooked and ate. Our blankets are too thin for this country, but with the aid of a good camp fire each night we managed to keep fairly warm, although our hands and feet nearly

froze. We walked into Flagstaff tonight, leaving our car 4 miles out, in the midst of a drift that almost conceals it. We expect to go after it in the morning and run it into Flagstaff.—PERCY F. MEGARGEL.

Winslow, Ariz., Dec. 27—Reo Mountaineer reached here today. Christmas was spent in the snow crossing Canyon Diablo. The nights are below zero. The last three caught us outdoors.—PERCY F. MEGARGEL.

GERMANY'S SHOW

Berlin, Dec. 17—An outline of the plans of the show to be held here from February 3 to 18, under the auspices and joint control of the Automobile Club of Germany, and the Association of German Motor Vehicle Manufacturers, is out. It will be held in Landes Austellungs park, near the Lehrte railway station, within easy access to all parts of Berlin. The exhibition will be divided into five sections, as follows: Motor cars, for



INCIDENTS OF MEGARGEL'S FLAGSTAFF ADVENTURE

the transportation of persons, also for sanitary, fire department and military service; motor cars for industrial purposes; motor cycles; motor boats in so far as the size and conditions of the exhibition space may be adequate and adaptable to such exhibits; parts and accessories of motor cars, including wheels, tires, together with automobile clothing, literature pertaining to the use of automobiles for sport, travel and transportation, and drawings and touring maps. Rent for floor space will be at the rate of \$7.14 and wall space \$5.95 per square meter. For outdoor exhibits space will be charged for at the rate of \$2.38 per square meter.

CITY PAYS DAMAGES

Milwaukee, Dec. 24—The city of Milwaukee will be forced to pay for the automobile of Dr. A. C. Sidler, which was torn to pieces in a collision with a manhole on Trowbridge avenue, between Delaware and Kinnickinnic avenue, Friday night. The manhole stood 16 inches above the pavement and was unmarked by a light. The city will pay without a fight the price of the automobile.

REO MAKES A RECORD

Touring Car Completes 1,000-Mile Non-Stop Run Under Difficulties at Capital

Washington, D. C., Dec. 22—L. S. Jullien, the Reo agent here, C. C. Singer and R. S. Lockwood, of the New York branch of the Reo Motor Car Co., had a taste of the strenuous life this week when they succeeded in making a 1,000-mile nonstop run on the streets of Washington in a 16-horsepower Reo touring car. No such a run had ever before been attempted here and its progress was watched with more than ordinary interest by automobilists. The weather conditions were all against the run, for the night before the start there was a heavy snow storm which left the streets in terrible condition. Added to these unfavorable conditions was the undue interference of the police, who attempted in every way possible to circumvent the drivers in their efforts to run a thousand miles over the streets of the capital city without stopping the engine. These were handicaps hard to overcome, but Jullien, Lockwood and Singer were determined to achieve their object, and they came out of the contest with flying colors, although Singer was mulcted out of \$30 by a police court judge on two charges of violating the speed law in different places.

Jullien had been planning for this run for several weeks. He thought he had it all worked out to his satisfaction, but after the run was well under way all the plans had to be changed because of the activity

of the police. The original plan called for the run to be made on Pennsylvania avenue, the principal street, starting from Washington circle and running to the Peace monument, a distance of about a mile in each direction. This route was taken for several hours, when the car was ordered off the avenue on the ground that it was a nuisance. After that the drivers did not follow any regular route, but drove where the conditions were most favorable. Several trips were made into the country during the day time, but at night the car was kept running over the city streets.

The car used was one of this year's models. It was equipped with Goodrich tires, while a Jones speedometer-odometer was used for checking purposes. Aside from the loss of a staybolt there were no mechanical or tire troubles and the entire distance was covered in 70½ hours. A record was not the object of the run, the sole purpose being to demonstrate that the car could cover 1,000 miles without stopping the engine.

Promptly at 11 o'clock on the morning of December 18 the car was sent away on its long journey with Jullien at the wheel.

The car plowed its way through the snow and slush and the engine was working in great shape when Lockwood took his turn 2 hours later. Each driver handled the car 2 hours and then laid off 4 hours for sleep. Aside from the disagreeable weather conditions nothing transpired to mar the run until 4 o'clock Tuesday morning, when Singer was arrested while on Pennsylvania avenue. After arguing the question for some time the policeman finally agreed to let Singer go if Jullien would give his personal bond for Singer's appearance in court. This was arranged and the run was again resumed after its narrow escape from being stopped by Singer's arrest. The next day during his period off Singer appeared in court and was fined \$30, which he cheerfully paid to the clerk.

Tuesday afternoon the drivers were thunderstruck to learn that the major of police had issued a general order commanding the police throughout the city to make as many charges against the drivers that the car would have to keep off Pennsylvania avenue during the busy hours, so frequent trips into the country were made, while at night unfrequented streets were used. The police were unable to make a single charge against the drivers and they were enabled to finish their great run without further molestation. The run was finished at 9:23 Thursday morning, December 21.

Despite all these drawbacks the public took intense interest in the trial. Doubtless the police cannot be blamed much for their vigilance, for if they had not been strict in the matter the traffic on the principal thoroughfares would have been effectually sewed up just at the busiest time. Still, the motorists following the test felt aggrieved and there was considerable grumbling over the high-handed methods taken by the powers that be to shunt the Reo into the background. The performance was highly commendable and Jullien and his mate deserve credit for their plucky fight against adverse weather, not to mention the obnoxious cops. It would not have been so bad if the city streets could have been used altogether, but those excursions out into the country where the snow and slush made the going hard told on the total time.

MERCEDES RUMOR

London, Dec. 16—It is rumored arrangements are now in progress for a flotation of the Mercedes company, but it has not been confirmed from official sources. It is, however, worth noting that the concession for the remainder of Europe, outside Germany, which a certain Parisian concern has held for some years, is stated to have just expired, and it is suggested—perhaps it has inspired the rumor—that the German concern is now at liberty to make other arrangements and to float for a considerable sum, without any necessity to consider interests other than its own.

MUST FIX OWN BREAKS

Rules for French Race Bar Outside Aid—May Use Fontainebleau Circuit

Paris, Dec. 14—The French club's tire race is an ill-starred event. When first proposed few people took it seriously and now, after struggling to the rules and regulations stage, it is in grave danger of being allowed to lie dusty and forgotten in the pigeon holes of the clubrooms. The sudden decision of the club to hold a road race next year is the cause of the fall in the fortunes of the tire race. No second bidding was needed by the sporting commission to prepare for the 1906 grand prize, and, although it only received its order a few days ago, arrangements are in an advanced stage. Radical changes have been made and next year there will be no work for specially

turns, and no grade crossings. They all run through splendid forest land, and owing to the shortness of the circuit—about 53 miles—and the fact that some of the roads in the center will have to be passed by each competitor three or four times to accomplish one round, the race could be followed much more interestingly than on some of the long circuits through isolated country, devoid of telephonic or telegraphic communication. The points where cars would have to cross the original track are at big clearings in the forest, meeting places of the hounds in ancient days, where there is sufficient room to construct separate tracks for cars going in different directions.

Propositions will still be considered by the club, but if nothing better than the Fontainebleau circuit is discovered within the next few days, it is certain that next year's race will be run at the gates of Paris. Long Island record crowds will appear as nothing, compared with the masses which will be at Fontainebleau for the race.

Much interest is centered in the Peugeot motor cycle exposed at the show, on which Giuppone lowered the world's motor cycle track record for 1 hour. On this specially constructed machine, which carries a 12-horsepower two-cylinder motor, and weighs, altogether, but 114 pounds, Giuppone was given a standing start on the Pare de Princes track the day after the opening of the salon. In 3 minutes 34 seconds he had got over the first 10 kilometers, in half an hour he had covered 32,024 miles, and when the 60 minutes were called off he had traveled exactly 63.6 miles. The fastest round of the track was accomplished at an average speed of 70 miles an hour. Maurice Fournier's world's record for the 10 kilo-

meters, established in 1903, was reduced by 17 seconds. Giuppone's time was taken every 10 kilometers and compares with Anzani's 1-hour track record as follows:

Miles	Giuppone	Anzani
6.2	05:34 4-5	06:29 4-5
12.4	11:21 3-5	13:01 4-5
18.6	17:14	19:37 3-5
24.8	23:08 2-5	26:00 1-5
31.0	29:01 3-5	32:28 1-5
37.2	34:52 4-5	38:56 3-5
43.4	40:54 1-5	44:49 1-5
49.7	46:51 2-5	51:10 4-5
55.9	52:55 3-5	57:31 2-5
62.1	58:38 1-5	1:04:14 2-5
Hour	63.6 miles	58.2 miles

FOR THE ENGLISH KIDS

London, Dec. 16—For the Christmas trade in toys for the children, English novelty manufacturers have turned out some little motor cars, from 11 to 16 inches long, finished with pneumatic rubber tires and able to run straight or in a circle. One is a racer, and another, with lamps and brake, has a nickelized headlight that can be lit. Among the latest novelties is a motor omnibus driven by clockwork, beautifully modeled and japanned and running on rubber-tired wheels. Another source of joy to a boy is a motor outfit.



REO CAR WHICH MADE A 1000-MILE NON-STOP RUN

MAY UPSET ROAD WORK

Action of the Minnesota Legislature Likely to Knock Out Highway Commission

St. Paul, Dec. 22—The Minnesota Good Roads Association held its state meeting in the capitol building in this city yesterday, and beyond a rather interesting display of fireworks, little actual work was done. The meeting served to bring out the fact, however, that Minnesota's new highway commission law may after all be knocked out before it is well started. According to statements made by Minneapolis delegates to the good roads meeting, the legislature first passed a highway commission law and then turned around and recommended a constitutional amendment which legislates the highway commission out of business. The constitutional amendment was ostensibly to increase the amount of the state tax for roads and bridges, but in re-enacting the section of the constitution, the legislators entirely left out the authority for a highway commission.

Governor Johnson will go ahead and appoint his highway commissioners next week, however, and it will start work January 1. The state legal department will be asked to pass upon the new amendment, and if it actually does revoke all authority, express or implied, for a highway commission, the good roads association will begin an immediate campaign throughout the state, to defeat the amendment when it comes before the voters.

The country and city districts mixed at the meeting yesterday in some interesting debates. Representatives from the newer sections of central and northern Minnesota objected strongly to the statements of city delegates that the farmers knew nothing about road making. "The farmers made the roads that have built up Minnesota," declared one member, "and they know the principles of practical road building. Up in our country we don't want automobile roads at \$3,000 a mile, but we want more good hard country roads and more state aid to build them."

It is generally agreed that the new state highway commission, if invested with full power, as the law intends, will start Minnesota upon a new era of road building. It is hoped that implied authority will be found in the constitution for the creation of the commission, so that the constitutional amendment approved by the legislature may be accepted by the people, even though it leaves out the provision authorizing a commission. This amendment increases the road tax from 1-20 to $\frac{1}{4}$ of 1 mill on the property of the state. It will mean a fund of nearly \$250,000, instead of the present income of \$60,000. With this amount the commission can do a great deal of work within the next few years.

Jackson, Mich., Dec. 23—The rousing good roads meeting which Mayor Todd has planned to hold in this city will probably come off January 4. It is expected that a large number of persons from all over the state will be present, and, as about 400 are expected from Jackson

county alone, the number will swell to probably double that number. Some excellent speakers have been secured, among them being State Highway Commissioner Horatio S. Earle of Lansing and J. D. Dort of Flint. Among the prominent men of this county who are interested in the success of the meeting, and who have promised to take an active part in the sessions, are Arthur L. Landon of Springport, James A. Dean of Parma, J. D. Ballard of Leoni, Edward Ambler of Brooklyn, J. Russell Fisk of Tompkins, W. B. White of Summit and David Croman of Munith.

Since the initiative step was taken by Mayor Todd the township of Henrietta in this county has started along the road that leads to good roads. At a meeting of voters it was decided to build at least 1 mile of good road every year. This will be started in the spring.

TO FIGHT THE GRAFTERS

Philadelphia, Dec. 23—The Philadelphia Automobile Trade Association is about to take up the subject of chauffeur graft. Many members of the association have recently been solicited by chauffeurs of private owners for a rake-off on the sale of a car on the ground that without their O. K. the sale would have gone elsewhere. In at least two cases the hold-up was attempted even before the purchase, the chauffeur going from agency to agency, getting the highest figures, boldly announcing his intention of recommending the car which brought him the largest commission. The matter was quietly brought to the attention of the officers of the association, and an inquiry along the row soon brought to light the fact that few of the prominent branch managers and agents had not been so approached, many of them half a dozen times. It also developed that in a few instances some of the tradesmen, particularly anxious to effect a sale, had allowed themselves to be mulcted of a portion of their profits. One case was brought to light where a chauffeur, after the sale of a car and the refusal of the agent to cough up, had actually threatened to give the car a black eye—this despite the fact that his employer had not even consulted him as to what machine to purchase. This grafting operation, it appears, has not been confined to the cars themselves, but to everything in the nature of supplies as well—tires, oils, repairs, etc.—and has been quietly assuming such proportions that the association is determined to put a stop to it before it becomes universal.

MATINEE BEACH MEETS

Philadelphia, Dec. 26—A. H. Chadbourn, manager of the Cape May Automobile Club, has in mind the promotion on that beach next season a series of matinee races on the lines of similar trotting contests, which were successful at the Empire City track, under the administration of Alfred Reeves. The plan is to divide the cars into various speed classes and as they win in their own class to move them up to the class above. Prizes of nominal value are given for each race and trophies at the end of the season go to those cars which have progressed most successfully from one class to another. Club races might be run the same way.

LIFT BAN ON STEAMER

Britons Propose Special Fuel Allowance or Cars Like the White in Trophy Race

London, Dec. 15—The regulations for the British Tourist trophy race of 1906 has just been issued by the automobile club and it is evident therefrom that pressure brought to bear by the Society of Motor Manufacturers and Traders has resulted in the abandonment of the preferential treatment which was proposed in favor of steam cars. Owing in a great degree to the sportsmanlike attitude of Frederick Coleman, of the White Steam Car Co., who, with a full knowledge of the disadvantages under which his car would labor in a fuel competition as against internal explosion engines, entered two cars and did remarkably well in the race, which was held in the Isle of Man last September, the officials were induced to propose a special fuel allowance for steam cars for 1906, equivalent to about 16 miles per gallon. But as there are practically only three steam cars selling in this country, and all the development appears to be in the direction of the internal combustion engine, the proposal was received with much dissent, which culminated in the remonstrance of the Society of Motor Manufacturers to the automobile club. As a remonstrance of that kind is, in itself, a veiled threat, the club had no alternative than to treat the test as being a purely consumption trial.

The more reasonable motorists, however, while not agreeing with the proposal of the club to permit an arbitrary allowance of fuel to particular types of cars in competition with others less favored, think that, as steam cars use lower grade fuel, the cost rather than the quantity should have been the basis from which the question could have been fairly decided, more particularly as such a basis would have induced a tendency towards using low grade spirit. As the rules stand, every car must use spirit of a specific gravity between 0.695 and 0.705 at 60 degrees Fahrenheit. The other conditions which are new are, that the minimum weight of chassis shall not be less than 1,275 pounds, while the load to be carried, exclusive of fuel, water, oil and replacements, shall not be less than 1,125 pounds. This is to include weight of driver and one passenger. The principal alteration here is that the maximum weight of chassis, insisted upon last year, is now removed, consequently the manufacturer can make his car any weight he chooses so long as it is not less than the minimum. Other fresh conditions are that every car before competing must demonstrate it can be driven for half a mile on a level road on the top gear at a speed of 12 miles an hour without any manipulation of the clutch, and it must also be capable of starting on and ascending an incline of 1 in 6. This is, of course, done in order to prevent abnormally high gears being used in assisting the car on down hill stretches only, and also to insure that the car has a starting speed gear sufficiently low to make it a practical road vehicle.

The projected tire trials of the Automobile Club of Great Britain and Ireland have been postponed for a fortnight, and the date for receiving entries extended to the end of January. This result has no doubt been arrived at by the disinclination of the leading manufacturers to give it their support, and the disadvantage to the less important firms of having to push through arrangements for, to them, a very important event, inside practically a month. All the large firms possess sufficient cars to enable them to know how many sets of tires they wished to enter, if they so desire, but with the small firms the matter is different, and as the success of the event appears to now hinge on the support of this latter class, the date had to be extended to give them time to make the necessary arrangements, not for tires, but for cars. It is stated the Dunlop, Palmer, Michelin and Continental tire companies will not take part in the contest, and as nine-tenths of the motor tire trade of the country is done by these four firms, the trading interest in the event will probably be little.

AS ENGLISH FOUND PARIS

London, Dec. 16—From all accounts the actual commercial results obtained by placing the Olympia show date in front of Paris has resulted pretty much as the British trade anticipated. At least that is the opinion of those members of the British trade who have been on duty as English representatives on the stands in the Grand Palais. Although the press correspondents who were across have asserted that the stream of English and American visitors has been even more pronounced than at any previous Paris show, the experience of the English representatives has been that little of British business was there to be gathered in, and that, in any case, little of such business was obtained by them. How this condition of affairs will be dealt with by the French trade and the French automobile club, is not known, but it is just possible that the Paris date may be changed. So far as the business obtained for British shown goods, such as the Napier, Humber, Wolseley and Star, there is no brag, if there are no details worth publishing, so that one may take it that business for these, too, was quiet and had all been secured at Olympia.

HAD HARD TRIP

Alpena, Mich., Dec. 23—One of the most interesting automobile trips ever taken was participated in by C. F. Steele and Joseph Germain, of this city, who have just returned from Onaway. At Onaway they delivered an automobile to C. H. Freeman, an insurance agent and owner of the Onaway opera house. It was the first one ever seen in that section of Michigan. It took a little more than 7 hours to make the trip, a distance of 70 miles, and a great many stops had to be made along the way to explain to farmers just what it was in which they were riding. Travel was also impeded by 5 inches of snow. During the whole distance the roads were exceedingly bad. The trip over the jack pine plains to Valentine lake was a lonely one, and from Valentine to Onaway, a distance of 24 miles, the journey was still more dreary. Only one person was seen in 36 miles of travel.

CAR FACTOR AT POLLS

British Motorists, Fighting for Repeal of Speed Limit, Think They Hold Whip Hand

London, Dec. 16—It is generally considered that England is now on the threshold of a general election of members to parliament, and in consequence motorists are bestirring themselves to see in what manner the event can be turned to their advantage. Sir Alfred Harmsworth, who, by the way, has been created a baronet by the out-going conservative ministry, has issued a formal letter, in which he proposes that every motorist should aid the candidate who appealed to him for his suffrage and the assistance of his motor car. It is generally considered that the motor car will play an important part in the impending election.

It is a remarkable fact, but nevertheless one which has always been accepted, that people who spend the most of their time in discussing politics with more or less ardor, should on the one day of days, upon which they can put their ideas and opinions into concrete form, be swayed or intimidated or prevented from registering their votes by the mere matter of personal convenience in getting to and from the polls. But the paradox is there and in that knowledge lies the motorists' strength.

Sir Alfred Harmsworth suggests no motor car should be lent to any candidate to carry voters to the poll unless he pledged himself to assist in the new parliament towards ameliorating the motorists' position by altering the new motor car act so as to eliminate the speed limit. It is, perhaps, as well to explain here that parliamentary candidates are not permitted to hire vehicles to convey voters to the poll. In legal phraseology this is classed as intimidation and corruption, but as there are many other ways of choking the dog, the restriction simply plays into the hand of the candidate with the greater following among those who possess vehicles which can be loaned. It is also open to political associations to arrange for the assistance of vehicles on behalf of the candidates of their particular choice, so that in the long run the matter comes to practically the same thing. But, particularly in country constituencies where voters are inconveniently situated to get to the polling booths, the motor car is certain to be of great assistance, inasmuch as it will cover 20 miles to a booth in less time than an ordinary horse vehicle will cover half the distance, besides which the capacity of the automobile is one of time, not mere physical energy, so that the side which can command the greatest number of motor cars can be expected to poll the greater number of its political strength.

It is not difficult to see that at the present time this preponderance will fall to the conservative party; the agents of that party have been organizing their motor car resources so they can be concentrated and flung, like a military division in war, on the points at which it will be most effective, however widely separated. Mo-

torists in general realize that here is their opportunity to demonstrate their strength and gain the legislation they have been demanding. With such valuable ammunition at hand in the way of quick transportation facilities for the voters, what politician will have the temerity to stand out against them, and if he does, what show will he have to be elected if he depends upon the horse-drawn vehicle to bring his voting strength to market? The motorists, if they only realize it and stick together in this fight, can win.

WANT NEW LAW PASSED

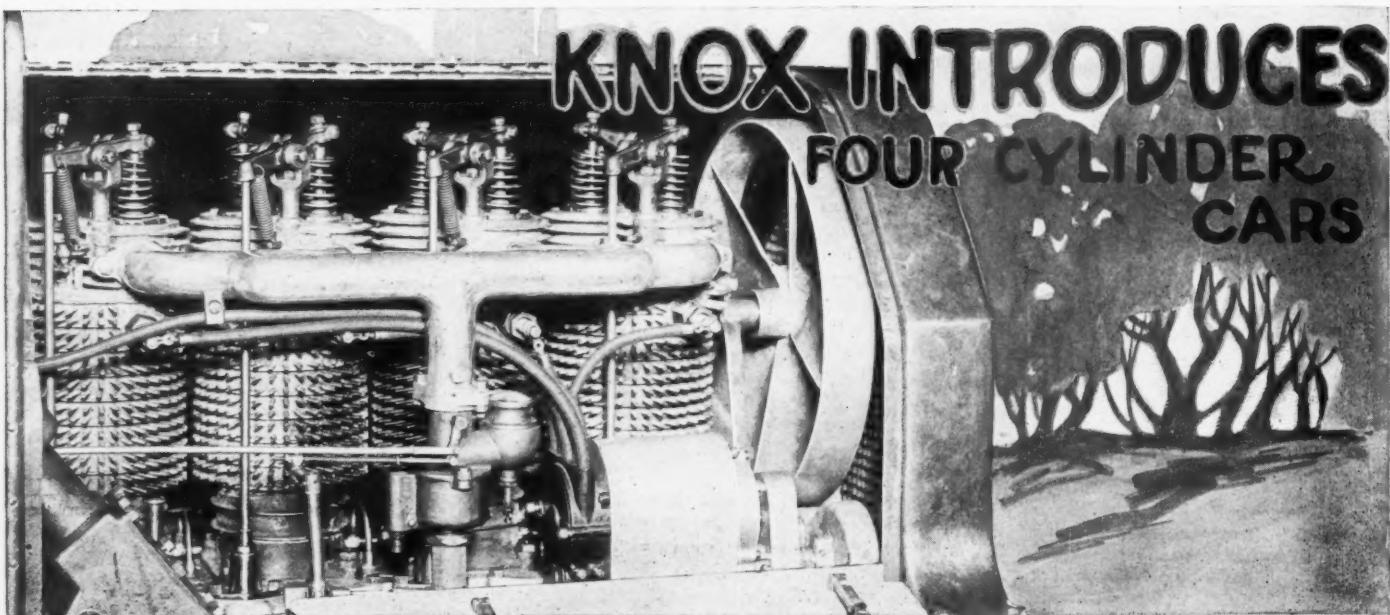
Syracuse, N. Y., Dec. 26—Syracuse automobileists are uniformly in favor of a law creating a New York state automobile commission, which shall take care of the interests of the automobileists. Whether this should take the form of a state highway commission with a bureau devoted to automobile has not been decided. In case a bill is passed by the legislature creating such a commission Frederick H. Elliott, of this city, secretary of the New York State Automobile Association, will be a candidate for one of the places on the commission and will have the support of a large number of automobileists throughout this section.

The matter will be threshed out at a meeting of the directors of the association during the New York show, and whatever is decided upon will be embodied in the form of a bill to be introduced into the legislature.

The automobileists are dissatisfied with the manner in which they have been treated at Albany. They are in favor of a graduated tax upon all motor vehicles, the money to go into the good roads maintenance fund. Secretary Elliott has letters from Winthrop B. Scarritt, former president of the A. A. A., and from William H. Hotchkiss, of Buffalo, president of the state association. Judge Hotchkiss favors a state highway commission to include a bureau in charge of vehicles using the highways. This he believes necessary on account of the good roads amendment to the constitution recently passed, providing for the expenditure of \$50,000,000 for good roads throughout the state. It is thought that since such a large sum is to be expended, the roads should be looked after by a commission. Mr. Elliott agrees with whichever plan it is decided would be for the best interests of the state. President L. G. DeCamp, of the Watertown Automobile Club, recently held a conference here with Mr. Elliott, H. H. Franklin and other prominent automobileists who were agreed that some sort of a commission should be appointed.

BUCKEYE ENTERPRISE

Toledo, O., Dec. 26—John Jenkins, recently of pugilistic fame, has moved to Urbana, O., where it is rumored he is contemplating starting a motor bus line between Urbana and Mechanicsburg. The proposition at present is to use only one car over the route until the line has been popularized a little, when a second car will be added and the trips doubled. Urbana and Mechanicsburg have no direct railroad connections, a fact which makes the starting of a motor bus line a particularly favorable enterprise.



NO TENDENCY in air-cooled machines for the approaching season is more conspicuous than the use of four vertical cylinders and the transmission of power through some form of clutch and sliding gear set. In previous issues Motor Age has described and illustrated the majority of the large air-cooled cars, many of which are built on similar lines. This week the Knox, built by the Knox Automobile Co., Springfield, Mass., the pioneer of air-cooled motors, is presented. This, too, has four cylinders placed vertically in front and has the power transmitted through a metal-to-metal cone clutch, running in oil, a Mercedes type of sliding gear and double chains. In addition to three models of this type the company is retaining its line of two-cylinder opposed air-cooled motors, all of which show many 1906 improvements, among which, most prominent, is a decided lessening of noise.

In the four-cylinder car, model G, the trade name of the new machine, as in all air-coolers, each cylinder is a separate casting, with the head integral and valve ports not required, because of placing the mechanical admission and exhaust valves side by side in cages, which reside in separate openings in the cylinder head, being secured therein by a single screw, with the consequent result that not a minute is needed to remove one. A two-part aluminum crankcase carries the four cylinders, each secured by vertical bolts passing through a bottom flange on the cylinders.

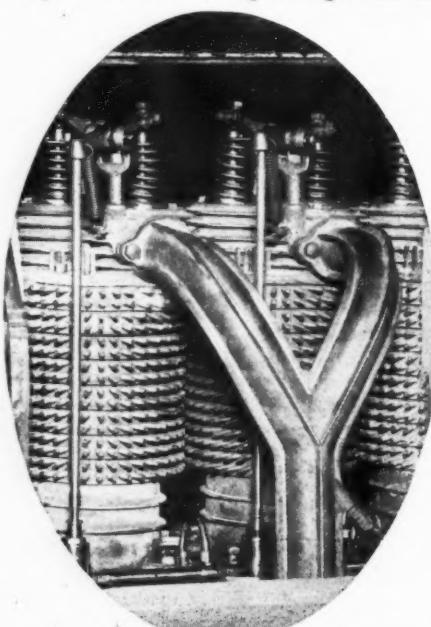
The Knox company, in all its horizontal motors of the present and past seasons has cooled by the pin, commonly known as the porcupine scheme, and which has worked without change for six seasons. It has been used in both pleasure and commercial machines, many of the latter working 12 months in the year in tropical countries like Cuba and other parts of the West Indies. Each cylinder is covered with corrugated pins—the corrugations spiral-like—screwed into the walls. These pins in model G are arranged in thirty-two rows encircling each cylinder, with some fifty pins to each row. The sharp edges of the corrugations on the pins make good radiating surfaces and the pins, entering the cylinder walls $\frac{1}{8}$ inch,

draw the heat from the inner portion of the wall as well as from the outside surface. Each pin is 1 3/16 inch long and $\frac{1}{4}$ inch in diameter. Much experimenting has been done by the company in determining the exact proportion of radiating surface and air blast and in properly locating the pins. Other experimenting was made in fan construction, with the result that the fan is of large diameter and is carried on a separate bracket on the front of the crankcase. The fan blades are made like those of a propeller and are integral with the hub and periphery band. On the cylinder walls below the pin portion are two circular radiating flanges, and on the head of each are five other flanges, made extra deep. Both of the Y-shaped exhaust pipings from the cylinders are made with four radiating ribs, which should be included in the general cooling scheme. This model has been tested under all the varying circumstances common to motoring and have the cooling features worked successfully. Cylinder bore and stroke are $4\frac{3}{4}$ and $5\frac{1}{2}$ inches.

Apart from the cooling arrangements the

valve actuation is deserving of special notice, inasmuch as it is by a separate overhead rocker arm for each valve, and that any valve can be removed or replaced in a few seconds. The inlets and exhausts are made interchangeable. They have a diameter of 2 inches, the inlets with a lift of $\frac{1}{4}$ inch and the exhaust $\frac{3}{8}$ inch. Steel and nickel alloy serve in their composition. In actuation two camshafts are required, one at the right for the intakes and one on the left for the exhausts. Each camshaft runs in three bronze bearings and is driven through steel and bronze gears, enclosed in aluminum cases, on the front of the motor. Push rods with the usual rollers for bearing upon the cams work in long vertical sleeve guides on the crankshaft, their only support, and at their tops, rounded for the occasion, rest in cup-shaped receptacles in the ends of the rocker arms. A short coil spring, with one end secured to the cylinder head and the other to the rocker arm, keeps the arm resting at all times on the rod, and prevents striking noises that would result if they were not held together. One end of the spring hooks to the cylinder head and can be quickly removed. All rocker arms are angularly placed on the heads and supported by yoked standards screwed into the cylinder heads, within the yokes of which the rocker arms are pivoted on bolts pinned in position. The end of the rocker arm resting on the top of the valve stem is yoked, and carries between the yoke arms a screw stud, which can be adjusted to vary the valve lift. Another screw in the yoke arms acts as a locknut for this one. By not having the rocker arms pivoted to either the valve stems or the push rods it does not interfere much in valve removal.

The crankcase, a split aluminum chamber, carries the five crankshaft bearings in its upper half, the lower portion serving for carrying oil. The crankshaft is made from nickel steel, cut from the solid slab and turned and ground to a balanced finish. Each of the five bearings are $1\frac{1}{8}$ inches in diameter and the four forward ones are $2\frac{1}{8}$ inches long, the one at the flywheel end having a length of 4 inches. Bronze bearings are used throughout. The pistons



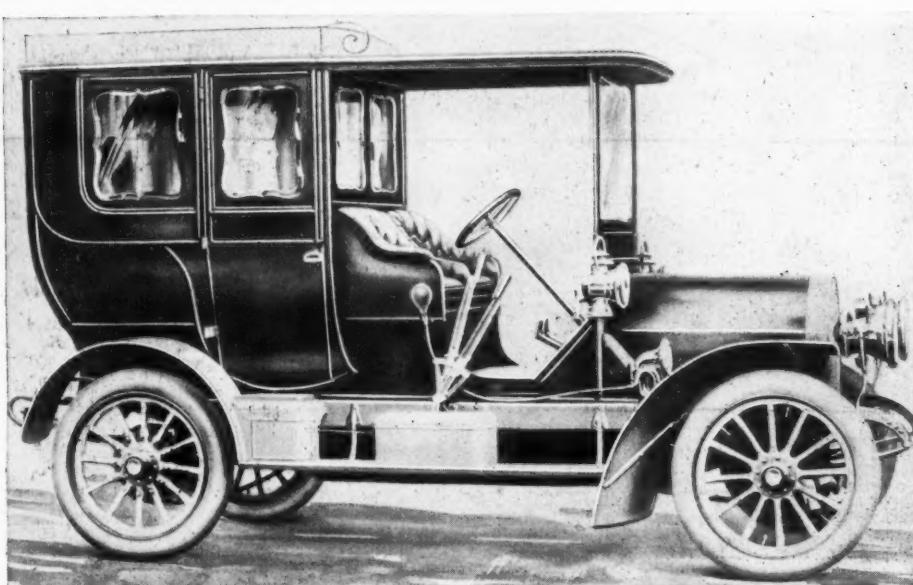
EXHAUST SIDE OF TWO KNOX CYLINDERS

follow typical lines in every detail and are carried on the connecting rods by hardened steel pins 1 inch in diameter and affording a bearing in the connecting rods $2\frac{1}{4}$ inches in length. The crankpin bearings are $2\frac{1}{2}$ inches long and have a $1\frac{3}{4}$ -inch diameter. Each piston carries three compression rings.

Attention has been given the lubrication of all engine parts. In the bottom of the crankcase, which is considerably dropped for the purpose, is a rotary oil pump, working in an oil well, the pump being driven from the exhaust camshaft by spiral gears and a vertical shaft. From this pump oil ways lead to all bearings of the crankshaft, and by means of hollow connecting rods the crank pins are lubricated. The pump is of sufficient capacity and power to force a large oil surplus, the bearings being designed so this excess drains off and falls into the crankcase, being strained and used again. A pressure regulating valve is placed in the system, and on the dash is placed a regulator. By a nut and screw adjustment on the regulating valve any desired oil pressure may be obtained. This pressure is shown by the indicator. By this system oil is furnished in direct proportions to the motor speed. The disposition of the pump, its drive and the oil leads are shown in the side elevation of the chassis.

A touch of foreign construction is seen in the ignition, in which ordinary spark plugs carried horizontally in the right side of the cylinders below the inlet valves are supplied with current from a high tension magneto carried on the right side of the crankcase. The magneto is gear driven. The current in the magneto is low tension, but is transformed to high tension in a single coil within the magneto and is distributed to the plugs by a secondary distributor, which forms a part of the magneto. A dry battery is carried for emergency uses. One wire connects from the magneto to each plug and a fifth connects with the dash, where a switch serves to connect the dry cells.

A Holley carburetor furnishes mixture, which passes by way of a three-Y piping to the inlet valves. Both governor and hand control are used on the throttle. The throttle arm, which can be seen hanging almost



KNOX 35-40 HORSEPOWER LIMOUSINE CAR

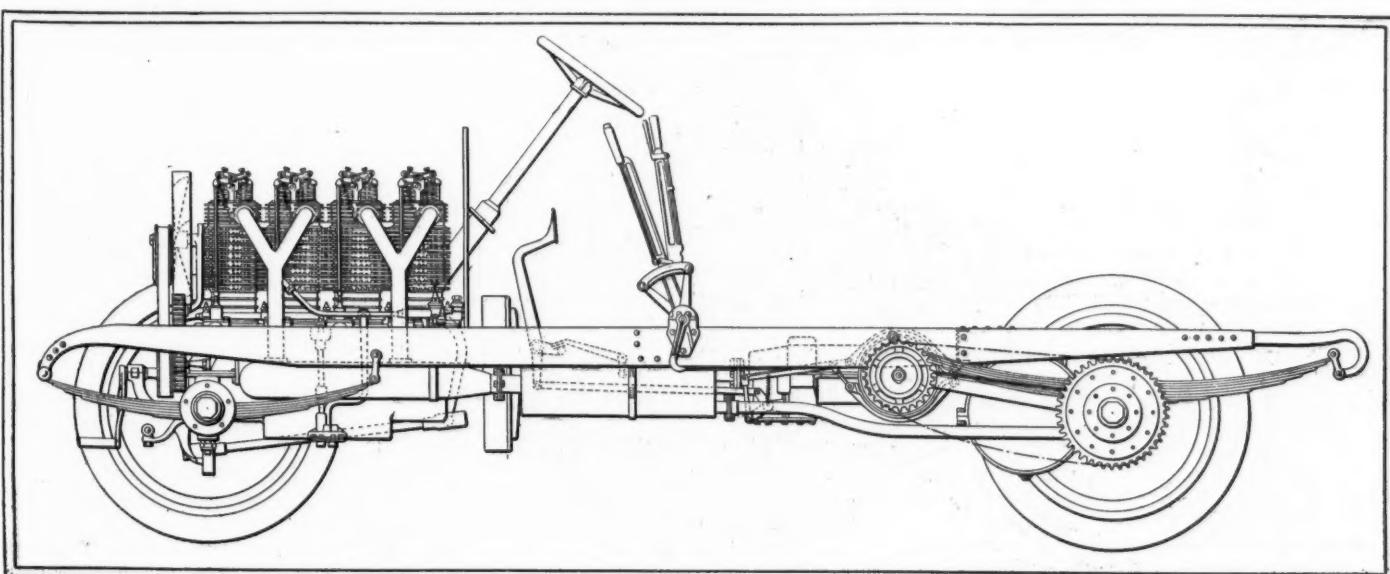
vertically at the side of the mixing chamber, connects by a rod with the steering column control and beneath the connection with this rod it connects with a shorter one to the clutch. A spring surrounds the clutch rod, one end resting against a washer on the rod and the other against a ring on a horizontal arm connected with the clutch. The spring permits the throttle being controlled irrespective of the clutch. With this connection the motor speed falls when the clutch is withdrawn, but immediately resumes the original speed on engagement.

An innovation in American practice is shown in the metal-to-metal cone clutch. An oil-tight chamber encloses the cone surfaces and a few spoonfuls of oil is sufficient to lubricate them for a week's service. When the clutch is not engaged the surfaces of both the male and female parts are covered with an oil film, which must be expelled before both parts are positively connected. Time is required in this expulsion, which is sufficient to prevent the car starting with a jump when the clutch is thrown in.

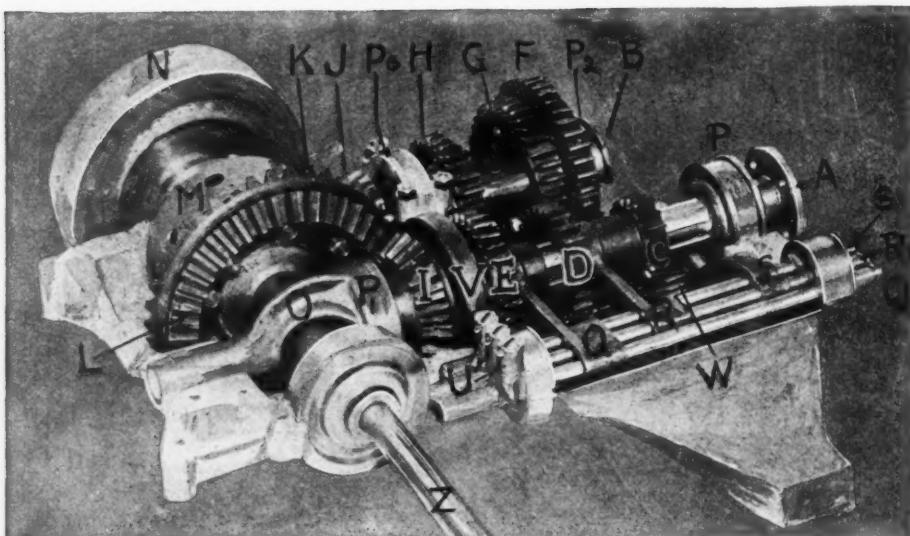
A universal joint is not used between the clutch and gear box. The latter is pat-

terned along Mercedes lines and gives four forward speeds and one reverse, all obtained on the selective system through three sliding units within the case and through a single lever working in a gate quadrant. Throughout the gear set only materials with high tensile strength have been used, the shafts being made of nickel steel showing tests above 120,000 pounds to the square inch. The gears are made of chrome nickel steel capable of withstanding a strain of 175,000 pounds to the square inch. Non-adjustable Hess-Bright ball bearings are used on all shafts. The case, of cast aluminum and divided horizontally in line with the main shaft bearings, takes its support through four integral arms; the forward pair being very wide and the rear pair only the width of the differential housing part. In the top portion are easily-removable inspection covers.

The main shaft A is of large diameter and has four fluted keys to drive the two sliding members, gears E and D-C. It is coupled direct to the clutch shaft and revolves in a long bearing P at the front and another P1 at the rear. The latter bearing is carried from the floor of the case and



SIDE ELEVATION OF CHASSIS OF KNOX 35-40 HORSEPOWER AIR-COOLED FOUR-CYLINDER TOURING CAR



KNOX SELECTIVE SLIDING GEAR SET

is braced by an arched arm O spanning the jackshaft and resting against the rear end of the case. The counter shaft B runs in a pair of bearings P₂ and P₃ and has the three spur gears F, G and H rigidly secured to it and also the bevel gear J, which meshes with one of the bevels K on the differential. The gears of the differential are of the bevel variety and are enclosed in the perforated case M. Another differential bevel L is in constant mesh with the bevel I which, by the way, is integral with an internal gear V, both being on a short hollow shaft within which is the rear end of the shaft A, having its rear Hess-Bright bearings within these gears. It is thus apparent that the shaft A can be revolved while the gears I and V are idle. For direct drive or fourth speed the gear E is moved into the internal gear V, thus locking the shaft A with the bevel I and driving through this bevel and bevel L on the differential. On this speed the countershaft with its gears is revolving but none of the gears are in mesh. For the other three forward speeds and the reverse the drive to the differential is through the

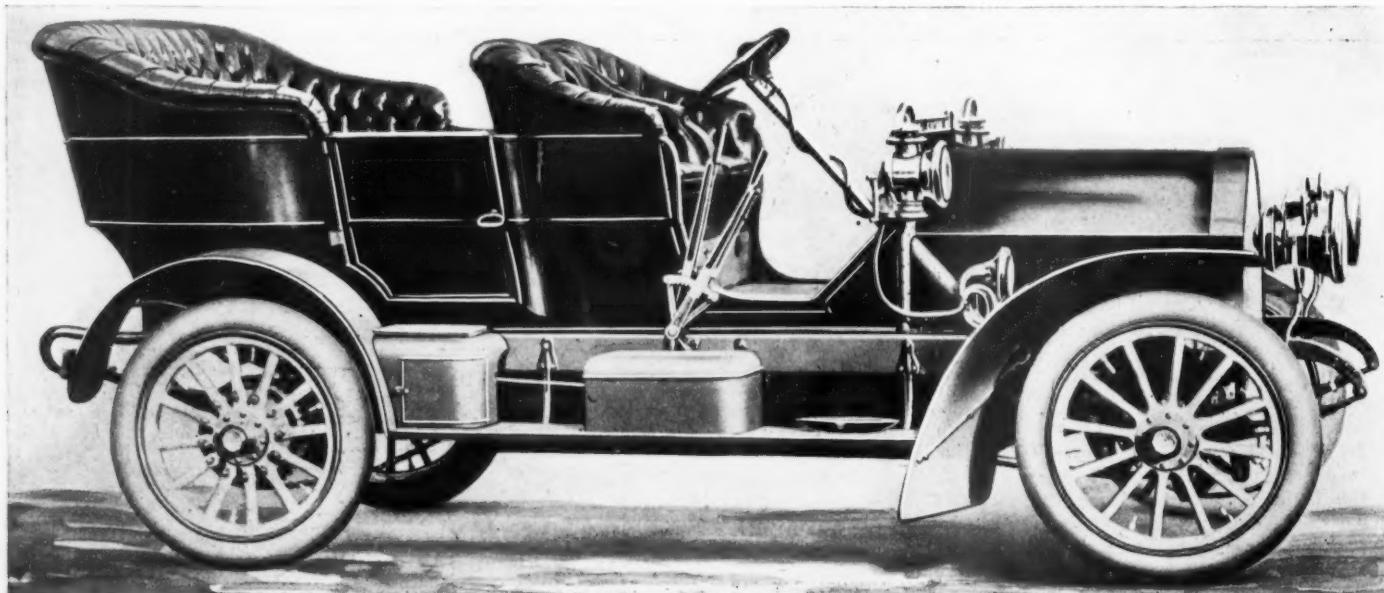
bevel J on the countershaft and K on the differential. Third speed is obtained by meshing sliding gear E with H on the countershaft, the former being moved through the shifting rod yoke Q and the rod Q₁, for second speed gears D and G and meshed through the shifting yoke R and its rod R₁ and on slow speed gears C and F are meshed through the same shifting mechanisms. In reversing an idler W on a separate shaft in the bottom of the case is jointly meshed with gears C and F by shifting yoke S and rod S₁. The three shifting rods are operated from a single lever working on the ordinary selective principle. Three plunger balls are contained within the casings U. Each is held down by a spiral spring and enters in a cavity in the top side of its respective shifting rod when the gears moved by the rod are in perfect mesh.

In connection with the speed changing arrangements can be noted the regular brake, which is of the metal-to-metal variety and in the form of a band operating on the drum N on the jackshaft. Emergency brakes are of the internal expanding type, located within dustproof drums on the back

wheels. They are applied by the side lever and are connected with the clutch so that their engagement disengages the latter, whereas the pedal brake is furnished either connected with or not.

As in all previous Knox chassis strength has been an object. Both axles are of I-beam section, forged from a special grade of nickel steel made with a tensile strength of 120,000 pounds. Each is made in a single piece and is oil-tempered and annealed. The steering pivots and levers are single forgings made from the same material. Axle dimensions are 2 by 1½ inches, the rear axle is stationary and straight throughout and the forward one stepped 4¾ inches inside of the front spring seating so as to afford protection for the bottom of the engine case. All road wheels are 34 inches in diameter, the forward tires are 4 inches and those on the rear 4½ inches in diameter. Imported Hess-Bright ball bearings are used in all of them. Pressed steel constitutes the frame pieces, the side members of which are straight throughout and made in channel sections with a 5-inch depth at the center and 1½-inch channel webs and a uniform wall thickness of 5-32 inch. Short spring hangers serve in front but in rear are the long curved familiar Daimler type. Four semi-elliptic springs connect the frame and axles—the forward 42 inches in length and 2 inches wide and the rear pair 54 inches long and of the same width. The wheel base approximates 112 in both the touring car and limousine and the tread is standard.

As in the power and transmission plants, innovation in the body lines is met, in fact, in the new body types, two of which are illustrated, not a point of resemblance can be found with present models. In the touring car room for five passengers is provided in the tonneau, the rear seat accommodating three, and two jump seats serving for the others. Wide side entrances are used, the front seats are divided, and running board and large fenders are conventional throughout. A honeycomb type wire screen forms the front of the hood and by surrounding it with a heavy brass framework, a radiator effect is produced.



KNOX MODEL G, FOUR-CYLINDER AIR-COOLED 35-40 HORSEPOWER TOURING CAR



EX-BENNETT CUP CANDIDATE CONVERTED INTO TOURING CAR

Next English Show—Crystal Palace is next on the English show circuit, the dates being January 26 to February 3.

Converted Racer—John Hargreaves, whose 80-horsepower Napier took part in the English eliminating trial to pick a team for the Bennett race, has converted the racer into a touring car.

Invites Everyone—The American Motor League invites all automobileists who go to the shows at New York to attend the league convention, which takes place during the same week. Reduced rates of fare have been secured from all railroad lines, covering the entire week.

Woman Passes—The first woman to pass the rigid test of the Automobile Club of Great Britain and Ireland for a driver's license is Miss Mee, a daughter of a West Sussex clergyman. Miss Mee has also demonstrated her motoring cleverness by turning in a paper on the motor car act that is declared to be the best submitted so far.

Ross Passes Up Ormond—Owing to a difference of opinion as regards the disposition of prizes that he may possibly win, Louis S. Ross, holder of the Sir Thomas Dewar trophy, will not go to Ormond this season. The Stanleys built a steam racer according to his plans and specifications and Ross was to drive it. Both are reported to desire the prizes that may be won, and neither will give way to the other, so Ross, who desires to retain his amateur standing and reputation, will be at the meet as a spectator and not as a participant.

Motorphobia Abroad—English motorists are exulting over a victory they recently gained in the courts. One of their cycling scouts who had given testimony in a case against a driver arrested for speeding was prosecuted by the police for perjury. The case came up before a motorphobic judge, who not only justified the police for setting traps, but also declared the evidence astonishing. The jury took a contrary view and discharged the scout. The defense introduced photographs to prove their case. Another case was against a man charged with driving

to the common danger, the evidence consisting of the fact that 5 minutes after the car had passed the children from a neighboring school came on the road.

Clubs May Merge—The Austin Automobile Club is making overtures to the Oak Park Automobile Club looking to a merger of these two Chicago organizations.

Kiser Back—Earl Kiser, now in rugged health, although a cripple, has returned to Dayton, O., where he will start the Earl Kiser Auto Co., handling the Winton and Autocar, as soon as he can find a location.

Good Excuse—One of the causes for the bankruptcy of Ralph Dickerson, an English publisher, was given as "fined for furious driving on ten or twelve occasions, costing in all about \$1,250 in penalties and costs."

Motor Skate—One of the novelties shown at the French show was a motor road skate. On a miniature four-wheeled chassis is attached a small gasoline motor. The device is fastened to the feet and for it is claimed 25 miles an hour on smooth roads. The motor is coupled direct to the back axle, which carries the driving wheels. The wearer of the skates directs his course by means of a small bogey on the front wheels and the gasoline tank is carried strapped around the waist of the

operator. No way of stopping the motor, though, is given.

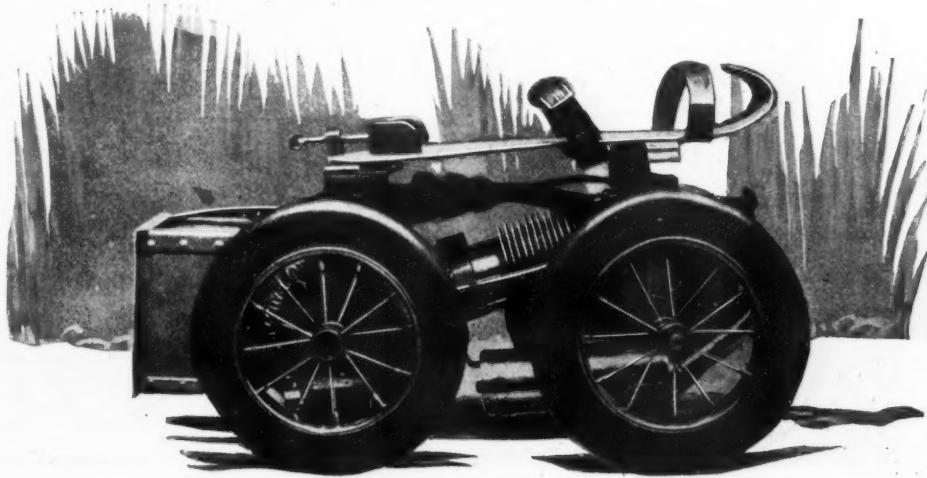
Real Actors—Barney Oldfield and Tom Cooper have temporarily abandoned their intention of entering vaudeville to become an important part of the Liebler production, "The Vanderbilt Cup," which is to be put on at the Broadway theater, New York City, beginning January 8, with Elsie James as the real star.

Dinsmore Car to Kaiser—Clarence Gray Dinsmore's big Mercedes racer is now the property of Emperor William of Germany, according to advices from Europe, which state the late patron of road racing left the machine to his friend, the kaiser, in his will, besides bequeathing \$2,000 to the Herkimer tour.

Florida Parties—The Chicago Automobile Club is arranging a party to go to Florida for the Ormond meet, working in conjunction with the Minneapolis Automobile Club. The train will leave January 20. Detroit motorists will also have a special car which will leave New York over the Seaboard Air Line January 21.

Loaded With Coin—The National Cash Register Co., of Dayton, O., since it changed its system of paying its employees, dealing out the coin instead of checks, is using an automobile to transport the money from the bank to the office. On this weekly trip \$55,000 is carried, two armed guards accompanying the messenger in the car from the bank.

Aid to Santa Claus—In Philadelphia there is a Santa Claus Association, an organization of women who annually, about Christmas time, make it their business to gather food, clothing and money from those more fortunately situated and distribute them among the deserving poor. This year the quantity of such supplies gathered was so great that its distribution during the week preceding Christmas day became a matter of much doubt. The difficulty was solved, however, by Managers A. E. Maltby, of the local branch of the Winton Motor Carriage Co., and Percy Neel, of the Quaker City Automobile Co., each of whom placed several automobiles, with their operators, at the service of the charitable women with the result that by Sunday night every package of the veritable mountain of presents had been safely bestowed upon the numerous beneficiaries of the society by the women.



MOTOR SKATE FOR ROAD USE, INVENTED BY FRENCHMAN

WELCH TOURING CAR,

40-45 HORSEPOWER



WELCH TOURING CAR, 40-45 HORSEPOWER
FOUR-CYLINDER MOTOR AND CLUTCH GEAR

MODEL D, the 40-45 horsepower four-cylinder 1906 car of the Welch Motor Car Co., Pontiac, Mich., carries most of the marks of distinction of the present machines, to which are added, however, a few of the recognized next year's designs, as well as other decided novelties. Notable among them is the placing of the water pump in the center of the radiator and having it take its supply from the top half of the radiator and deliver it to the bottom portion, from which it passes by individual pipes to each pair of cylinders. Later it passes through a similar pair of pipes from the cylinder pairs to the top portion of the radiator.

Nothing out of the ordinary exists in the running gear, but solid construction is used in every part of it. The pressed steel channel side sections are narrowed at the forward end alongside of the motor, the maximum depth of the channels in the middle of the side pieces is $4\frac{1}{2}$ inches; frame cross pieces are riveted in place and reinforced by gusset plates. A set of semi-elliptic springs 40 inches long and $2\frac{1}{4}$ inches wide support the frame pieces in front and a pair of full ellipses of the same measurements carry the rear of the frame. The front axle is an I-section drop forging carrying the Elliott type of steering knuckles and the back axle is of typical live construction. The wheel base is 114 inches.

Novelty in the motor is found first in placing the valves in removable cages in the opposite sides of the cylinders, mounting them at 45 degrees to the vertical and operating them through an overhead cam-shaft and rocker arms. The rating of 40-45 horsepower is estimated on normal crank-shaft speed. Conventional lines rule in the cylinders, which are cast in pairs with all parts, such as the heads and water jackets, made integral. Valve ports are not required. A little out of the ordinary, but not new with the Welch concern, is the arching inside of the tops of the cylinders, giving the combustion chambers a hemi-

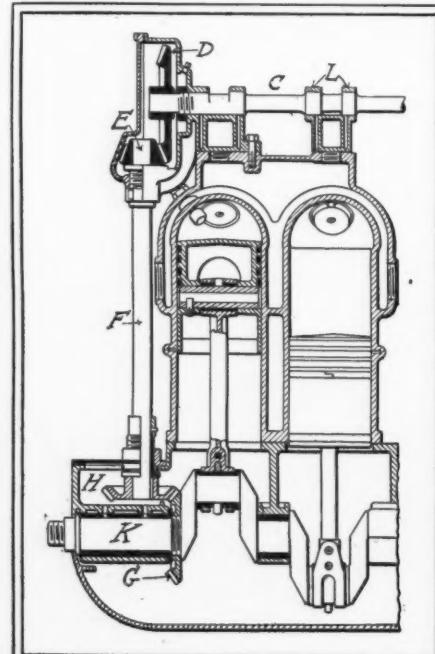
spherical shape. The crankcase is a two-part casting, the lower portion assisting only in carrying the oil bath. The duties of the top portion are to carry all of the five crankshaft bearings, as well as having four integral lugs through which the motor takes its support on the main frame pieces.

All the three moving portions within the cylinder, the crankshaft, connecting rods and pistons are carefully made. The crank-shaft is machined down from a stamped blank of chrome nickel steel and to remove friction the bearings are ground to size. These, by the way, are of different lengths, the three intermediate ones being $1\frac{3}{4}$ inches in length, whereas the forward end one is $5\frac{1}{4}$ inches and the rear one $5\frac{29}{32}$ inches long. On the rear end of the shaft is a large flange to which the flywheel is bolted.

Each connecting rod is an I-section drop forging fitted with bronze bushings to receive the hardened ground steel wrist pin which is pinned to the piston journal, but at its lower end exhibits construction not widely followed in motor cars. Instead of the usual connecting rod cap bolted and cotterpinned in position, the lower end of the connecting rod is arched out to receive the upper half of the bushing. The lower part of the bushing rests in a U-shaped metal stirrup, the ends of which span the lower part of the connecting rod and are attached thereto by a pair of bolts, in which provision for adjustment is included. This adjustment is made by having one bolt formed with a taper section near its ends where it passes through the stirrup arms. By tightening this bolt the halves of the bushing are brought closer together.

A slight cone effect is noticeable in the piston heads, the center of the head being the highest with a gentle slope to the sides. This shape, combined with the arched top of the cylinders, gives a peculiar-shaped combustion space. Four compression rings, all located above the wrist pin attachment, are used. They are pinned against rotation.

Valve disposition as well as movement can be studied from the sectional illustration of the motor, one of which shows an end section and the other a side section of one pair of cylinders. Both admission and exhaust valves have a diameter of $1\frac{3}{4}$ inches and are interchangeable and are retained in cages B that screw into the cylinder heads, the seats of the cages having a ground fit with the cylinder heads. Each valve A has its head and stem made integral, the former, as usual, beveled to 45 degrees and the latter working in a long removable guide within the cage. A heavy spiral valve spring surrounds the stem, the inner end resting on the cage proper and the outer end retained in a cup-shaped washer surrounding the stem and which is backed by a washer support and split washer



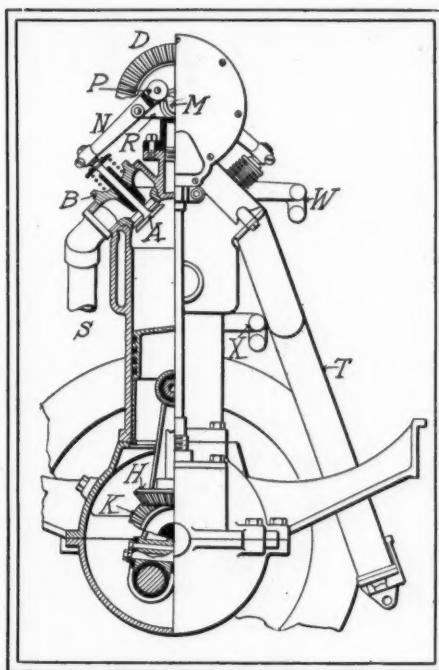
SIDE SECTION OF ONE PAIR OF CYLINDERS

which fits in a groove cut in the end of the stem. The spring is of special wire.

Along the top of the motor is the horizontal cam rod C resting in a pair of supports L in each cylinder head and carrying between these supports cams M for operating the rocker arms N which are carried on short horizontal arms R in the cylinder heads. The ends of the rocker arms resting on the valve stems are suitably cup-shaped to receive the rounded ends of the stems. On the other ends are rollers P which bear upon the cams M. By pivoting the rocker arms close to the ends carrying the cam rollers, a good valve lift can be had without using too large cams on the overhead camshaft C. On the rear end of the camshaft is the large bevel D which meshes with a smaller bevel E on the top of the vertical shaft F. This shaft, in turn, takes its power from the crankshaft through the pair of bevels H and G. The lower bevels are entirely enclosed within the crankcase and as a consequence are lubricated from the splash, but the upper pair is enclosed within a housing supported by brackets to the end cylinder casting and is lubricated by an oil level. The inlet piping S is longer than usual, the carburetor being carried as low as the crank case. The exhaust pipes T form a series of easy steps from the front to the rear cylinder, the pipes being of large diameter and well removed from the cylinder walls.

Novelty is shown in the cooling scheme. The waterjackets enclose the cylinder heads and project down one-third of the piston stroke. The water pump is carried in a chamber in the center of the radiator and driven from the rear of the radiator by a broad belt Z the fan Y being on the same axis and driven by the same belt. The pump chamber is cylindrical, with an end plate at the back and a front cap through which it may be removed or repaired. The rotary part of the water pump is located between the removable cap and an internal flange around the circumference of the chamber. In the rear of the pump chamber is a large opening connecting with the top half of the radiator and through which the pump draws its supply. In the forward part of the pump chamber is a similar opening connecting with the lower half of the radiator. Water enters the rear compartment of the pump casing, and passes into the forward one where it receives its impetus from the propeller-bladed pump. Should the pump fail to work, the design is such that the water will circulate by thermo-syphon action. Should it be necessary to take the pump out it can be removed through the front opening and with the cap of the opening replaced the cooling system is as complete a circulating system as before. Behind the radiator is a propeller fan of standard lines.

In lubrication recourse is had to splash within the crankcase for supplying practically all of the motor-moving members with their share of lubricant. A central partition divides it into two compartments and through this compartment is an equalizer pipe placed about $2\frac{1}{2}$ inches above the bottom of the case. When the car is running on level surfaces the oil will stand the same height in each half of the crankcase, but on ascending a grade part of the lubricant will flow through the pipe so as to



END SECTION WELCH MOTOR

maintain a level in each compartment. In order to properly collect the splash each connecting rod at its lower end has its bearings fitted with little oil scoops which serve as collectors of the splash and from which the oil flows to the bearings. In the top of each crankpin bearings are other little troughs for collecting the oil from which oilways are drilled into the bearing. The lubricant, after passing through these bearings, flows into the crankcase, where it is used again. Provision is made for preventing the oil in the end bearings of the crankshaft working out through the bearings ends. To prevent this little oil stops are inserted. Each is a ring located in a groove cut in the motor bearings and from the bottom of the groove is a duct which conducts the oil to the crank chamber. The camshaft bearings on the top of the motor are cared for by wick oilers. Other bearings such as in the gear set have an oil bath.

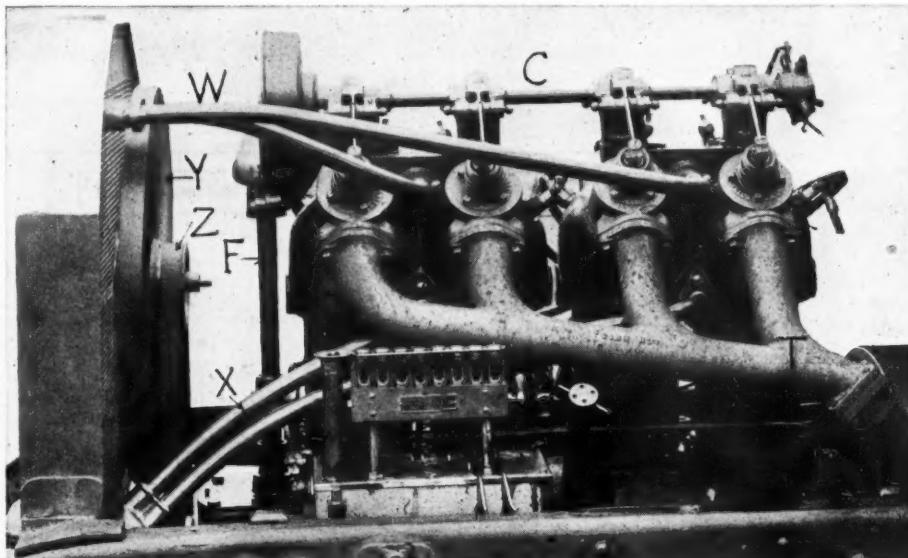
Mixture is supplied from a Holley carburetor of 1906 design. Jump spark igni-

tion is used. The spark plugs are placed angularly in the side of the arched cylinder heads and receive current from two sets of storage batteries, the current being commutated through a Leavitt ball timer, located on the rear end of the camshaft. A four-vibrator coil is carried on the dash. Control of the spark and throttle is from the steering wheel.

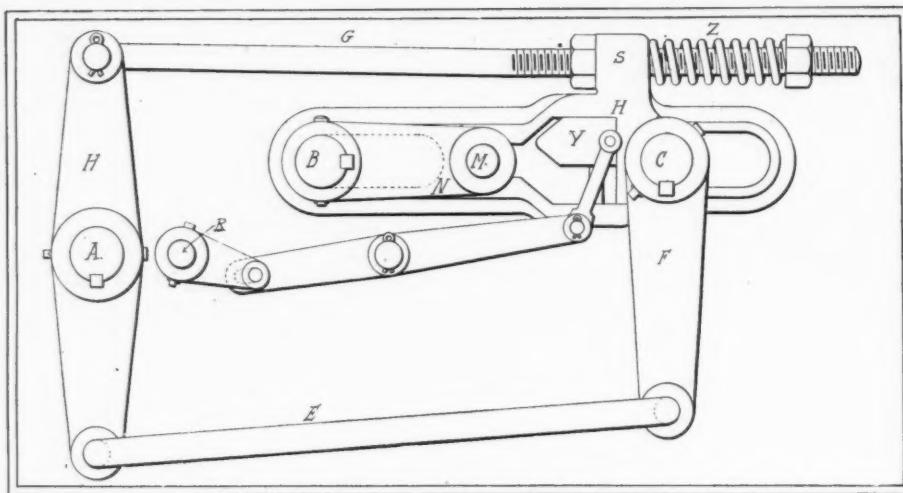
Two forward speeds and one reverse are given by the gear set which is novel in many details. It is based on the individual clutch principle and gives direct drive on the high speed without a single gear revolving. The countershaft remains stationary. One of the novelties is that two types of clutches are used—two of the multiple disk type and one, a double clutch, of the positive jaw type. All gears used are of six pitch and made from drop forged blanks, which are cut to form and case hardened. Both shafts are nickel steel and run in bronze bearings, the pair of which on the countershaft have end caps which prevent lubricant working out of the case ends.

A shaft O connects by a Hockham joint with the crankshaft of the motor and another shaft A axially in line with it to the rear couples, through a cardan shaft and bevel gears, with the differential on the center of the rear axle. The forward end of the shaft A is hollowed from the rear end of the case to where it ends at the multiple disk clutch G. Within it is a bronze bushing which forms the rear end bearing of the shaft O. One half of the disks in the clutch G are fitted to a hexagonal section of the shaft O and the other half are fitted to the shaft A so that pressing the two sets together will serve to lock the shafts O and A as one, which is done on direct drive. The method of pressing the disks is through a sliding collar K and a ring H screwed to the shaft and carrying cam levers H1. By sliding the collar K to the left the cam levers are separated, causing the cams to bear on the clutch disks, forcing them together and so locking shafts O and A as one.

To understand the other features of the gear set and how the other speed ahead and reverse speed are gained, it must be remembered that gears P, Q and S on the countershaft R are rigid with the shaft, revolving



EXHAUST SIDE WELCH 40-45 HORSEPOWER MOTOR

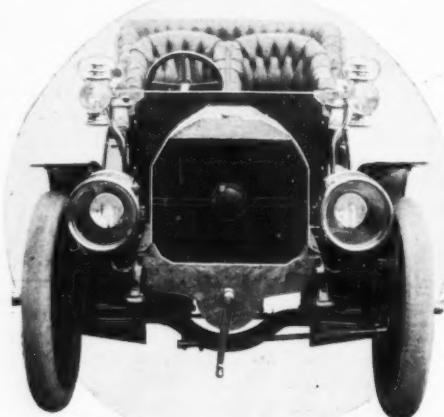


GEAR SHIFTING DEVICES FOR DOUBLE CLUTCHES IN WELCH GEAR SET

always when it does and vice versa. The three gears B, F and N are loose on the combined main shafts O and A so that as shown on direct drive the shafts can revolve and the gears remain stationary. Two clutches are made use of, M, a multiple disk one for locking the gear N to the shaft O, and another positive double-jaw one D, which is rigid with the shaft A and through which both gears B and F can be locked to the shaft A. In the clutch M one set of disks is fitted rigidly to the shaft O, being fitted to a hexagonal section of the shaft. The other set is fastened to a drum that also carries the gear N so that when the two sets of disks are pressed together through the sliding collar K being moved to the right and separating the levers L on the rings L which is screwed to the shaft A the gear N is locked to the shaft. For the second speed ahead two clutches are used, both operated through the same mechanisms. First the positive clutch D, rigid with the shaft A, is moved to the right and locked with the clutch teeth E on the rear side of the spur gear F. This locks this gear with the shaft A. After this is done the shifting mechanisms locks the gear N to the shaft O in the method before explained. Then the drive is from the shaft O through gears N and S to the countershaft R and from this shaft through the gears Q and E to the shaft A and to the rear axle by the shaft and bevels. It must be understood that the positive clutch D engages perfectly before the multiple disk clutch M locks the gear N to the shaft O. For reversing, an intermediate idler, not shown in the illustration, lies between the gears P and B and is constantly in mesh with both. In obtaining this speed the clutch D is moved to the rear, locking with the clutch teeth C on the forward side of the gear B and thereby locking this gear to the shaft A. After this is done the clutch M is used to lock gear N to the shaft O, when the drive is from shaft O through gears N and S to the countershaft, and from this shaft to shaft A through the gears P, the idler not shown and gear B. It will thus be noted that the clutch G is only used on direct drive, that on the other forward speed ahead and the reverse two clutches D and M are used in each.

The method of changing speeds is worthy of attention in that on all speeds, except the direct drive, two separate clutches have

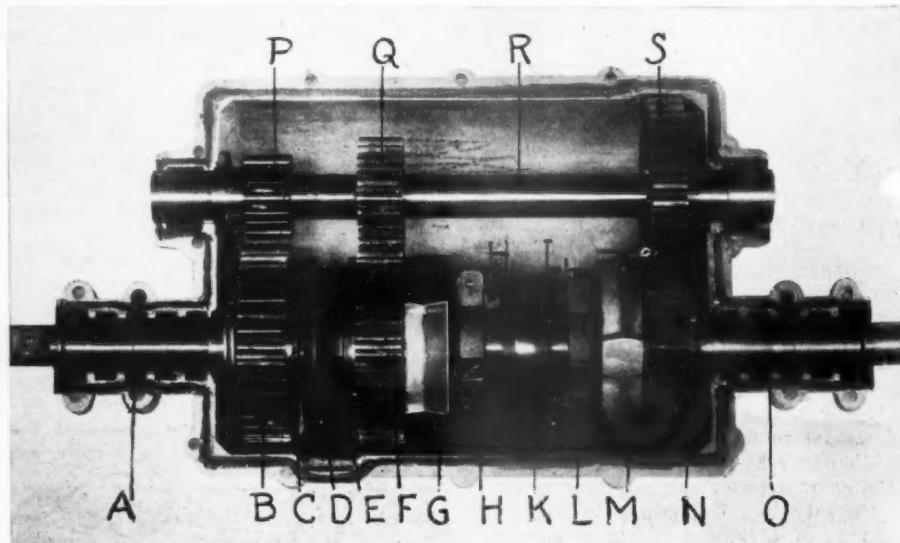
to be engaged, one a friction clutch making the gear N rigid with the shaft O from the engine, and the other the positive jaw clutch coupling either the gears B or F to the shaft A connecting with the rear axle. In all cases the positive clutch has to be



THE WELCH CAR

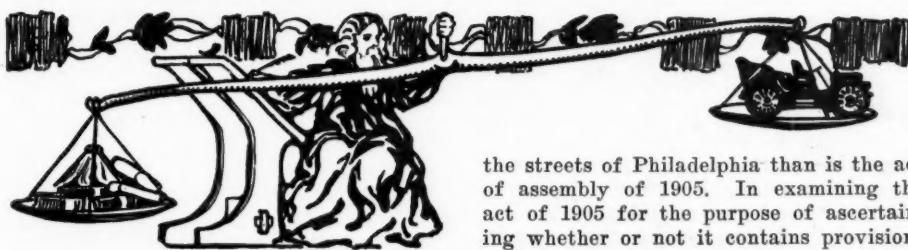
engaged first; in fact, it must be in perfect engagement before the friction clutch begins to operate. In accomplishing this an intricate shifting mechanism is resorted to. In the sectional view of it the gear-

shifting lever at the driver's right is keyed to the end of the shaft A. To this shaft is also keyed the double arm lever H. The two shafts B and C enter the side of the gear case and on their inner ends carry yokes, the first one having a yoke fitting over the clutch D and the other one connecting with the sliding ring K, by which the two friction clutches are operated. It can be noted that the upper end of the lever H connects by rod G with a lug S on the camplate H and that the lower arm of the lever connects through the rod E with a short arm F that is keyed to the shaft C. The connection of the rod G and the lug S is not positive, but through the medium of the coiled spring Z which is held in tension by a nut at the other end of it. A horizontal lever arm N is secured at one end of the shaft B and the other end is furnished with a pin M which passes through an opening or slot in the camplate H. Within the slot is a block Y connecting through a link and lever with a shaft R so that by moving the block Y into its several different positions in the slot the form of cam slots which guides the pin M is naturally changed. The illustration shows it in the neutral position. Supposing the driver uses his change speed lever, taking the arm H to the left at the top and to the right at the bottom, or counter clockwise, the shaft C is partly rotated in the same direction. This shaft being above the gear shafts within the gear box, the forward friction clutch M is engaged. A similar movement of the shaft A through the arm G results in the shifting to the rear of the camplate H and with the block Y in the position shown a clocklike movement would be given to the pin M, with the result that the jaw clutch D would be shifted to the front and the gear F locked with the shaft A. With the gear N fast upon the shaft O and gear F fast to shaft A slow speed ahead is obtained. Should the block Y first have been put in its low position and the shaft A rotated to the rear, the pin M would have taken a different course and moved upward, the jaw clutch thereby locking the gear to the shaft, giving reverse speed. For direct drive the shaft A is rotated in the direction of the hands of a clock, the camplate H is moved to the right and arm N brought to a central position.



WELCH CLUTCH TYPE, TWO-SPEED AHEAD GEAR CASE

LEGAL LIGHTS AND SIDE LIGHTS



RULES AGAINST QUAKERS

To the surprise of Philadelphia automobilists, the injunction asked for by the Automobile Club of Philadelphia restraining the local authorities from enforcing the municipal ordinance providing for the purchase and display of license tags on motor cars, was refused by common pleas court No. 4, Judges Willson, Audenried and Carr on the bench. The automobilists' main point was that the local law on the subject will, on and after January 1, 1906, be abrogated by the act of assembly of April 19, 1905. The court, however, was of a different opinion.

The decision partook of the nature of a right hook to the solar plexus, but it did not result in a knock-out. The club's attorneys are preparing to carry the case to a higher court. In any event, they will put one of the members in the way of being pulled in on New Year's day for failing to observe the local ordinance, and will fight to the last ditch. It is also proposed to have a man arrested for refusing to comply with the provisions of the new state law.

As the law stands now any picayune community in the state may frame a more or less radical set of automobile regulations of its own—always with a liberal license fee and a heavy fine for non-observance—and compel a continuous performance in the tag-changing line as a touring party crosses the state. The possibilities which last Wednesday's decision open up are, indeed, too numerous to mention in detail; and the majority of local automobilists, especially those who dabble in the law, are wondering at what they consider the short-sightedness of the learned judges.

Many of the conclusions of the court appear to be too intricate for the lay mind to grasp. For instance, the opinion says: "It is, of course, beyond all question that, if the statute and the ordinance are inconsistent, or, if the statute can fairly be regarded as intended to supplant the ordinance, the latter must give way and the statute only have effect given to it. Paramount authority of the lawmaking power of the state over the lawmaking power of the city must be conceded. The question therefore comes down to this: Is there any necessary incompatibility between the statute and the ordinance, or does it sufficiently appear that the statute was intended to furnish the sole rule of conduct and regulation for the use of automobiles and similar vehicles?"

The court answers this question by saying the city had full power to pass the ordinance of 1902, and that that measure was better adapted to protect people using

the streets of Philadelphia than is the act of assembly of 1905. In examining the act of 1905 for the purpose of ascertaining whether or not it contains provisions intended to take the place of a local or municipal regulation upon the same subject, the court says it may be noted in the first place that it contains no expression of an intention to that effect. The court was not impressed that, simply because the state had undertaken to impose certain regulations for automobiles operated in the commonwealth, such action excluded the right of a city to formulate and impose its own regulations. Reference is made to the fact that under the terms of the ordinance, the license to be obtained from the city is one which is based on certain examinations which the court does not regard as inconsistent with anything in the act. No satisfactory argument was presented against the right of the city to require guarantees from operators of automobiles additional to those required by the state.

The opinion then goes on to say that: "It has been argued that the act of 1905 was intended to provide that only one license number or tag shall appear upon the front and back of the vehicle when operated on the highways, but we do not regard this to be the proper construction of the act. It is provided that only one 'state license' number shall be carried upon the vehicle. There is no prohibition against the carrying of a license which was not a state license, and the limitation of the prohibition to a single class of licenses implies that it was not intended to exclude a local municipal license from being carried upon the vehicle. As to the word 'place' used in the act, the court does not regard the term as applying to a city or municipality within the commonwealth."

Laymen automobilists, when they heard this paragraph of the opinion read, looked at one another and seemed to say: "Now, wouldn't that jar you?" It was a little too finely drawn for them. As one of them said: "It sounds as if the court were hunting for pretexts for refusing the injunction. It seems to me that a contrary opinion could have been delivered without a resort to such intricate interpretations of the law."

Continuing, the opinion says: "It seems very plain that what was intended to be enacted by the clause just cited was that a foreign license number should be removed from any vehicle which comes from another territorial division outside of the state into the limits of the state. The language of the act—'while the vehicle is being used within this commonwealth'—the court construes as meaning that the vehicle in the mind of the legislature was

one which came from outside of the limits of the state of Pennsylvania."

One legal motorist points out that the court seems to have lost sight of the fact that the act of 1905 was particularly designed to do away with the conflicting regulations of towns and cities by establishing a uniform law for the entire state. It is also claimed there is a straining after a possible interpretation of the reading of that act which may be construed as favoring a city's or a town's right to enforce automobile provisions of its own that is especially apparent in the closing paragraphs of the opinion, which read as follows:

"It may be argued that there is an incompatibility between the statute and the ordinance in the different provisions which are contained in the two with reference to the rates of speed at which an automobile may be driven. The statute provides that no person shall be allowed to operate such a vehicle above a certain maximum speed under certain conditions. The question might arise as to what is meant by the term 'allowed,' and as to who or what authority might allow the use or operation thereof. Perhaps it would not be straining the force of language to construe this provision as referring to the constituted authority having jurisdiction over highways in any particular district. Aside from this point, however, it must be noted that the legislature only prohibited the driving of automobiles or similar vehicles at a higher rate than the fixed maximum speed. It did not state that they might be driven at that rate, except by implication, and that implication may be regarded as having been overcome by the further provision that the prohibition against exceeding a certain maximum rate should not be construed as permitting any person to drive an automobile at a greater speed than is reasonable.

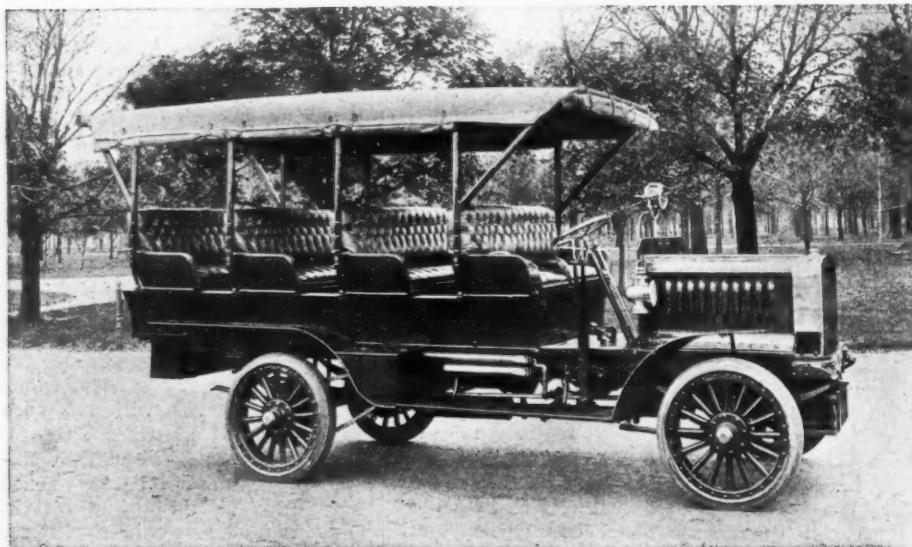
"It does not seem to us that this restriction of the force of the provision regulating the rate of speed should be regarded as applicable only to a particular case, where the question of the reasonableness of the speed might come before a jury, say, in an action for negligence. In the absence of any prohibition against local legislation it would rather seem that the legislature intended that the local authorities having jurisdiction over such a class of subjects, and having special knowledge of the conditions of their own localities, might by ordinance determine what should be a reasonable rate of speed.

"This we believe to be a permissible construction of the statute before us, and we believe that such a construction will best promote the interests of the various communities of the commonwealth composed of people living in closely-built towns and cities, and that no unreasonable restrictions are thereby placed upon people who desire to make use of the modern horseless vehicles, with due regard to the rights of others.

"We are unable to find in other portions of the act of 1905 anything which conflicts with the ordinance of 1902, and in view of what we have already stated we have reached the conclusion that the injunction prayed for by the Automobile Club of Philadelphia must be refused."



IN THE COMMERCIAL CAR FIELD



IROQUOIS GASOLINE STAGE COACH

BUILDING to the order of the promoters of a stage route in the state of Utah to connect a railroad terminus with settlements in the Uintah Indian reservation, the Iroquois Iron Works, of Buffalo, has turned out a machine which it thinks hits the nail on the head. It aimed to bring out a car that has power and durability to carry a sufficient load at a speed to mechanically meet transportation requirements and at the same time operate with a minimum amount of maintenance expense to insure its mechanical success. One of these models has been running on a government mail route in Utah and has apparently filled the bill. The chassis is so constructed that it will take any one of four bodies—stage, omnibus, van or platform truck. It is of heavy construction, this chassis, the main frame being of continuous 5-inch channel steel, with all the curves forged, and mounted on extra-long elliptic springs 3 inches wide. To the chassis are attached 36-inch wheels, fitted with 5-inch solid tires on the rear and 4½-inch on the front. There is a four-cylinder motor made of individual castings, with a 6-inch bore and a 6-inch stroke, developing 55-horsepower at 800 revolutions per minute, crank speed. There is sliding gear transmission; with three speeds forward and a reverse, the rear gears being cut from chrome nickel steel, 1¾-inch face and No. 5 pitch, stub length. There is a differential on the jackshaft, while the solid rear axle is fitted with 2-inch Timken roller bearings. The new model of the Whitney chain, with 1½-inch pitch, is used. The Remy type H high-tension magneto furnishes the ignition. The car weighs 7,500 pounds.

In the speed line the car is designed to go at an average pace of 15 miles an hour, but it can be sent along at 22 miles. The maker, however, believes when it is being used commercially that it should not be operated above 18 miles an hour. The seats on the stage are wide and built to accommodate four passengers on the three rear ones, although five can travel there without any more crowding than is customary on a horse-driven stage. Two can

ride in the front seat. With the full load on the weight is 11,000 pounds.

The machine is well designed for the use intended. The seats in addition to having good width so as not to crowd the passengers are made with ample foot room—a prime essential in stage traveling. Heavy upholstering is used in the seats and backs making traveling as comfortable as in a railroad coach and the canopy top provided is not only a protection against the scorching rays of Sol in the summer months but is a good preventive in autumn and winter days repelling with similar success the driving rains and winter winds.

PLAN TRACKLESS TROLLEY

Detailed plans of the cost and construction of a trackless trolley line across the bridge from Detroit, Mich., to Belle Isle have been taken up by the Detroit council committee on parks and boulevards. According to the estimates submitted the system would cost somewhere in the neighborhood of \$51,925. It is figured that at a fare of 2 cents for delivering passengers either at the casino or aquarium the system would pay for itself within a few years. The American Electromobile Co. has

submitted details of trackless trolley cars which are capable of seating forty persons each, and which it could supply under the proposed system. A proposition for a regular trolley line has also been submitted, but the aldermen oppose the laying of tracks and this will do away with any consideration for such a plan. Three other companies, including two in New York, are waiting to bid on the contract. The other waiting bidder is the Commercial Motor Vehicle Co., of Detroit. A full meeting of the council will undoubtedly be called to consult on the proposition and it is more than likely that Detroit will have a first class trackless trolley system in operation in 1906.

AGRICULTURAL MOTORS

The secretary of agriculture is manifesting considerable interest in a report recently to hand from Hull, England, regarding an experiment in applying motor power to farm work, as he believes the plan would be a good one for small farmers who cannot use agricultural machinery and motive power on a large scale profitably. From the account that has been received it seems that a party near Hull has been conducting some experiments in regard to the use of alcohol on the Ivel agricultural motor. Some months ago this party was able to arrange a simple attachment whereby paraffin could be utilized for the running of the motor, which was originally designed for gasoline, and was able to secure satisfactory results—that is to say, it was found possible either to start up on gasoline and after 5 minutes' running to turn on kerosene and run on the same for the rest of the day, or in case it is impossible to obtain gasoline it is possible to start up in paraffin and run on continuously. This is accomplished without the slightest trouble in regard to sticking of the valves or fouling of the engine, so it is said.

One of the most important points in connection with motors for agricultural purposes is the fact that they should run cheaply, that the upkeep should be small, and the running expense light. Therefore the question of fuel consumption and the cost of same is very important. Gasoline at the present time is somewhat expensive. It is easy for a wealthy owner of a car used for pleasure purposes to buy gaso-



THE IVEL AGRICULTURAL MOTOR DOING NIGHT WORK IN ENGLAND

line without feeling in any way that it is a burden to his pocket. At the same time, to the agriculturist using his machine only to help him with his work, the expenditure is an important one. Therefore the first step taken in the experiment under consideration was the utilization of kerosene, which can be obtained at half the price of gasoline. This shows a decrease in the running expenditure of half for fuel, and at the same time does not carry with it the many risks which are bound to occur through the storing and handling of gasoline.

Kerosene is a clean spirit to handle, and has many other advantages. Therefore, following up the experiments, alcohol was used for the third fuel test, and it may be said the same was attended with most successful results; the same machine with the same carburetor, with a very small attachment, and with no alteration to it making it different from what it was when running in gasoline, gave nearly the power and the same pulling results. The consumption was practically the same, and the party making the experiments felt elated over having carried out experiments so successfully on a fuel which has up to the present time baffled many motor engineers in so far as its successful use is concerned. The following results have been achieved with the three fuels, running the same machine on the same oil, and, in fact, the experiments were carried out on the same day: With 2 gallons of gasoline, 3 rods of land were plowed; with 2 gallons of kerosene 2 rods 35 poles were plowed; with 2 gallons of alcohol 2 rods 25 poles were plowed.

NEW OHIO CONCERN

The Commercial Motor Truck Co., of Toledo, O., has purchased a site at Plymouth, O., and has started the erection of a new plant, which will be built on the unit system. The first building to be erected will be of brick construction two stories high, 100 feet long and 64 feet wide. The company was incorporated October 17 under the provisions of the laws of Ohio, the capital stock being \$40,000. The new concern has been fully financed. A temporary plant will be maintained at Toledo until the new plant at Plymouth is completed. This will enable the concern to meet the demand for the new truck, a number of orders having already been secured. The model of the truck to be manufactured by the company was completed about 7 months ago. Since then it has been in constant use, being subjected to numerous tests. The accompanying illustration shows the truck climbing a 10 per cent grade with a load of 10,050 pounds of sugar. The design of the new model is the work of Fred C. Avery, formerly superintendent for the Chicago Motor Vehicle Co. Mr. Avery will be superintendent of the new plant at Plymouth. The office of the company for the present is at 805 Spitzer building, Toledo. Charles A. Keller is president of the concern. The first annual meeting of the company will be held on Tuesday, January 9, at which time the annual election of officers will be held. The company will employ about fifty men to start, but anticipates soon increasing this force, as well as adding to the buildings which are used for the factory.

ONCE AN ENEMY—NOW A FRIEND

During the past week Major Higginson, president of the Safe Roads Association of Massachusetts, who heretofore has been one of the strongest opponents of motorists, has come out in a new garb. In his annual report to his association he makes the flat-footed statement that the laws now on the books of the commonwealth which govern the use of motor vehicles are all wrong; that they produce a condition of affairs which prevents their being recognized by even the best disposed motorists, and that they should be revamped so that motorists will have a fair opportunity under the same. He believes it is not pos-

During 2½ months more than 10,000 automobiles were timed on 62 days, as follows:

	Miles an hour				
	15 or less	15-20	20-25	Over 25	Total
July, 18 days	885	882	86	3	1856
Aug., 22 days	2022	3028	204	11	5265
Sept., 22 days	1234	1660	170	1	3065

Total's 4141 5570 460 15 10,186
Stated in percentage the result is as follows:

	Miles an hour				
	15 or less	15-20	20-25	Over 25	Total
July	27 1/2%	47 1/2%	4 3/4%	1-6%	
August	38 1/2	57 1/2	3 2-5	1-5	
September	40 1/4	54 1/6	5 1/4	3-100	
Whole 62 days	40 1/2	54 2/3	4 1/2	1-6	

The foregoing figures are taken from the timers' note books. The number of



COMMERCIAL MOTOR TRUCK CO.'S WAGON

sible for a motorist to drive without breaking the law under the existing conditions, and virtually recommends the laws governing the use of motor vehicles be given over to the Massachusetts highway commissioners. The latter, however, do not desire to assume any such responsibility. Nevertheless that is the main idea of the Higginson report, which further advances the idea that the commission should establish a rate of speeds in different locations according to the road conditions thereabouts. He believes in the erection of sign boards announcing the speed limit in every section, and it is safe to say that in the future he will be a strong friend rather than an enemy to the motorists. The association of which he is president is the one which established the traps at Manchester during the past 2 years, the association which produced the famous Peabody, the man who went to New York to demonstrate to the officials there what was the best and most effective manner of disposing of the speed merchants. While his course thus far has been decidedly against the motor car, the fact that he denounces the state laws and other acts is all the more forcible, as he has had an opportunity to study the evil tendencies of present conditions and foresees others that are good and which should be adopted.

automobiles going faster than 20 miles an hour include several which the timers did not notify the police officers to stop, because the time was nearer 20 miles an hour than it was to the second or half-second next below the point of time at which 20 miles an hour was indicated. In other words, the speed was so little in excess of 20 miles an hour that it was disregarded.

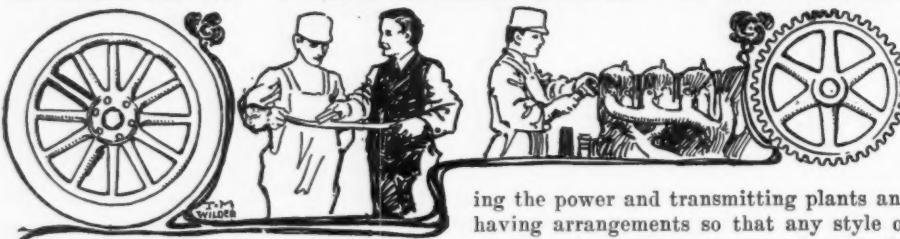
There were also several that the police officers failed to stop, either because there were too many at once and he could not stop them all, or because they turned off the highway before they had reached him, or because they refused to stop. Sometimes, too, the wires were out of order, and it was impossible to communicate with the police officer.

The notebooks of the police show the following:

	Refused	Stopped	to Stop
July	78	0	
August	170	3	
September	159	4	
Total	407	7	

After discussing the problems of unlicensed drivers and of machines registered in other states, the report outlines the method of bringing cases before the highway commission and its action thereon in general and specific cases.

Current Automobile Patents



Friction Drive—No. 807,623, dated December 19; to John W. Lambert, of Anderson, Ind.—In his friction drive automobile the inventor has a friction disk A on the rear end of the crankshaft and against the face of this disk is brought to bear the periphery of a friction wheel B, carried on a crossshaft on the frame. The wheel B is slideable on its shaft and on the ends of the shaft are sprockets for double chain drive. The feature of the invention is in the pivoting of the bearings C on the crossshaft so that when desired the driver can force the friction wheel B against the disk A with such force as to make positive contact for driving either ahead or reversing. The bearings are carried from the side pieces of the main frame by a pair of depending arms, one at the front and the other at the rear of the bearings. The bottom of the front bracket connects through the rod D with a pedal F in the car floor and the bottom of the rear bracket connects through the radius rod H with the rear axle. By pivoting both rear springs at their tops on a stub axle G the rear axle is carried bodily forward whenever the shaft C and its friction wheel B is carried forward to give positive drive. When in its forward position the rear springs are slightly tilted, but the main frame side pieces remain horizontal throughout.

Novel Frame Design—No. 807,958, dated December 19; to Ransom E. Olds, of Lansing, Mich.—The frame design illustrated is suitable for single-cylinder runabouts or small cars in which a one or two single vertical motor is carried in front. In the frame work the forward axle A is of conventional lines with typical steering knuckles, and mounted on the center of it is the forward portion of a tubular framework for supporting the motor and transmitting parts of the machine and connecting the axles. This frame consists of three portions. One a quadrilateral near the front axle with the front cross piece D connected with the axle, its two side tubular parts C made parallel and the rear member E connected by unions at the corners with the side pieces. From this rectangular part, in the center of which is the motor and gear case carried thereon by lugs, two diverging side pieces P extend rearwardly to the ends of the back axle, where they are united by a tubular cross piece B, which forms the axle casing and encloses within it the drive shafts to the rear wheels. Drive from the motor is by shaft, which is enclosed in the housing F, this housing being positively connected with the cross piece E as well as the axle housing B, so that the entire frame work and the front and rear axle is a compact support carry-

ing the power and transmitting plants and having arrangements so that any style of body can be mounted thereon through the medium of either full or semi-elliptic springs. The rear spring supports are shown in dotted lines inside of the rear springs.

Friction Drive Railroad Car—No. 807,627, dated December 19; to George W. Marble, of Chicago.—This inventor comes forward with a method of friction drive suitable for use on light railroad cars, such as used by section repair gangs, section inspectors, or special road men. A two-cylinder opposed air-cooled motor is carried crosswise in the center of the car, and connected through a friction wheel on a continuation of its shaft with a pair of large friction disks, placed on opposite sides of the friction wheel and one of which is adapted for driving the machine ahead and the other for reversing at the same speed. The merit of the invention consists in this last feature, that of reversing at the same speed as when traveling ahead, a feature particularly important in railroad work. Through a pair of levers the two friction disks are moved simultaneously, one towards the friction wheel and the other from it, for going ahead and in the opposite directions when reversing.

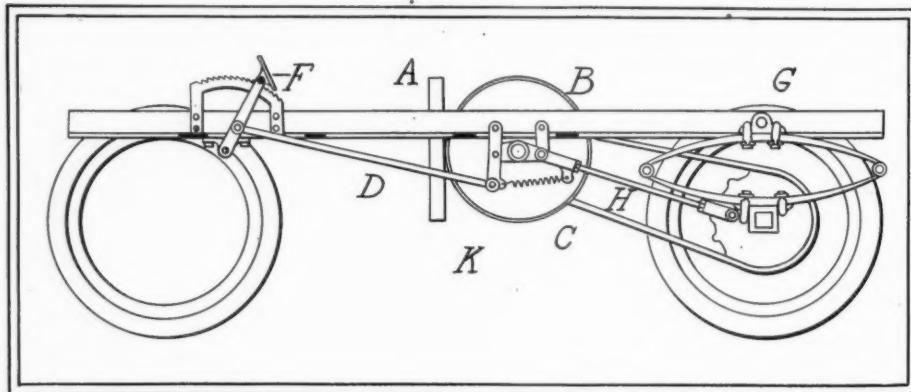
Triangular Drive—No. 807,457, dated December 19; to Benjamin A. Gramm, of Chillicothe, O.—This drive is for automobile designed for connection between the gear box and the rear axle through a cardan shaft. The forward end of the shaft takes its bearing in the front of a triangle, the sides of which are a pair of diverging support arms running from a cross piece of the frame to the side pieces. The forward ends of these arms are held together by a bracket through which passes the front end of the cardan shaft. The rear end of the shaft has its bearing supported beneath a cross piece of the frame. The inventor hopes by his design to get a shaft drive in which the shaft is quickly put in place and just as quickly removable.

Combined Differential and Gear Case Set—No. 807,771, dated December 19; to L. H. Pleuharp, Columbus, O.—In the invention, the differential enclosed within the rear axle has a pair of bevels, one with a single gear face and the other with two bevel faces, one of large diameter and the other considerably smaller. Between these bevels are two bevel pinions on the end of the cardan shaft. One of the cardan shaft bevels is made to mesh with the large bevel set on one of the differential bevels and also with the bevel on the other differential gear and another pinion on this cardan shaft is made to mesh only with the smaller gear face on the double differential bevel. All of these bevels both on the cardan shaft and the differential are secured to their respective shafts through the use of friction clutches operated through a lever close to the driver. When traveling on either of the two speeds ahead the bevels on the double differential are in use and in reversing the opposite single face differential gear is brought into use. The gear set gives only two speeds ahead and one reverse.

Semi-Pneumatic Tire—No. 807,748, dated December 19; to G. Knadler, Akron, O.—The tire described is to all appearances a solid one, held to the wheel by side flanges on the rim and cross bolts passing through the flanges and piercing the bottom part of the tire. The tire, however, is not solid, but carries a small circular air chamber in the center, the diameter of the chamber not being more than one-third of the diameter of the tire. A valve is not used for inflating this air chamber but the base of the tire is split and the air within it held only at atmospheric pressure when the tire is cold, but which of course increases with constant running. When the temperature increases the air within the chamber cannot escape because of the flanges and cross bolts holding the edges of the slit firmly together and forming, in short, an air-tight union.

Speed Controller—No. 802,540, dated October 24; to George A. West, of West Buffalo, N. Y. The device is for controlling the speed of gasoline engines. A governor is on the camshaft and to the governor weight is attached the outer end of a coil spring, the inner end being connected with a cam working on the valve stem, so that with high speeds the cam position is altered.

Protected Steering Wheels—No. 807,689, dated December 19; to Z. T. Sweeney, Columbus, Ind.—Over each front wheel the

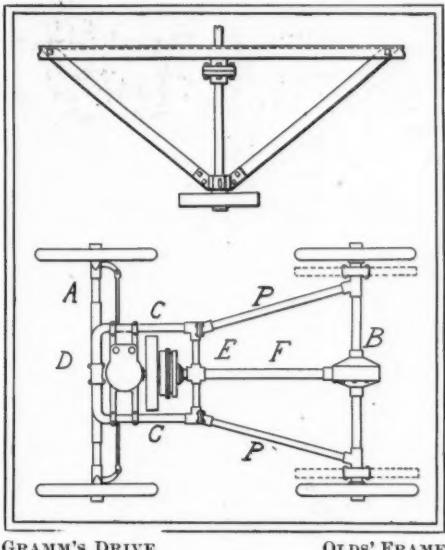


MOVABLE FRICTION WHEEL BEARING IN LAMBERT CAR

inventor places a hood device not unlike a wheel fender with the sides enclosed and covering the upper front half instead of the upper rear half of the wheel. In the forward part of this hood is mounted a wheel on a vertical axis. The wheel's diameter is perhaps 10 inches, not much greater than the width of the hood. The use of it consists in that should the road wheel approach an obstruction the hood and wheel will serve to either push the obstruction aside out of the reach of the tire or else the car will be thrust aside and perhaps save the damage that might otherwise be encountered.

Tonneau Foot Rests—No. 807,831, dated December 19; to R. A. Leslie, of Cleveland, O.—The invention is a folding foot rest for use in the tonneau of large touring cars, in which the base of the front seats are too far removed from the front of the rear seat to serve for such. The foot rest is an inclined board extending across the tonneau floor at convenient distance from the rear seat and at such an angle as to afford a comfortable rest. This rest when not in use folds up in rear of the front seats, where it is entirely obscured and not in the least in the way. This swinging is accomplished by hinging to the rear base of the front seat a pair of brackets and connecting the other ends of the brackets with the ends of the rest so that the folding movement is complete.

Compound Pneumatic Tire—No. 807,537, dated December 19; to E. M. Birdsall, Buffalo.—In his pneumatic tire the inventor instead of using a common air chamber uses one which is divided into a number of sections, each with a diameter equal to that of the common air



chamber but in length not more than one-eighth of the wheel's circumference. Between the adjacent air chamber is a connecting passage partly filled with an expansible material so that in case one section of the tire becomes punctured the air would be prevented flowing from other sections into it and so deflating the entire tire. In inflating each part is inflated from a common valve, sufficient pressure being used to overcome the expansible connection between the different chambers.

Friction Sliding Gear—No. 805,978, dated November 28; to Albert C. Menges, Grand Rapids, Mich.—The inventor's transmission is of the sliding gear type,

with a sliding unit consisting of three gears on the main shaft and corresponding gears keyed to the countershaft. Instead of driving them from the main to the countershaft through spur gears, friction wheels with beveled faces are used. These friction wheels are brought together for driving on low speeds and separated on direct drive so that on the latter only the main shaft is revolving.

Sand Device for Automobiles—No. 807,186, dated December 12; to A. L. Moss, Sandusky, O.—The invention is a device for laying sand on a road in front of the driving wheels of an automobile so that the wheels may secure sufficient friction to propel the machine. Five parts enter into the construction of the sand device: A sand reservoir with separate pipes, each with a spraying end leading to in front of the driving wheels, an air pump for furnishing air pressure for carrying the sand from the reservoir to the road, an air reservoir filled from the pump and a pair of working valves, one for controlling the sand outlet and another for the air outlet from the reservoir. The air pump is driven from the motor of the machine and can be thrown into gear at any time.

Spring Tire Lugs—No. 807,351, dated December 12; to J. H. Bleoo, New York city—Instead of having the casing of his tire composed exclusively of fiber and rubber the inventor places series of springs in the fabric, one series overlapping the other. The outer ends of the springs are bent and extend into the tire lugs, thereby holding the lugs in place without having a portion of the air chamber between them in order to retain them in position.

THE READERS' CLEARING HOUSE

SHOWS UP EVANSTON

Oconomowoc, Wis.—Editor MOTOR AGE—There is more intolerance and hypocrisy in the city of Evanston than there is tyranny in St. Petersburg. If the ways of courts and police in Evanston were universal in our country the liberty of law-abiding citizens would be less than that which is begrudgingly given to the serfs of Russia. Automobilists are arrested in Evanston for daring to be seen driving their machines within the limits of the city. A short time ago I drove an automobile from Oconomowoc to Chicago. Returning through Evanston alone I took great pains to drive carefully and slowly, for I had heard about the way the police arrested automobilists who were driving their cars with due caution and care. I was on a street called Ridge avenue. The roadbed is smooth, the street is straight and wide, is not in the business part of the city, and, when I was driving along over its smooth bed, not a team or a human being was anywhere within sight on the street. Suddenly a policeman stood in front of me and raised his hand. He was very near me, not more than 20 feet distant, but so slowly was my car going the policeman was in no danger. I stopped in 10 feet. I had no thought that I was to be charged with fast driving or that I was arrested. I asked the policeman what he wanted. He said nothing, but looked behind me. Just then came from behind a

boy riding a bicycle. He spoke some words in a low tone to the policeman, who then began to apologize for his request that I "go to see the judge." The policeman well knew that I had not been driving recklessly or fast, and he showed so much regret that he must take me to the judge that I concluded he well understood I would be convicted, regardless of the real circumstances. The boy bicyclist swore that he, upon his wheel, followed me as I drove my machine; that he had an instrument called a speed-indicator upon his bicycle, and that the instrument indicated that his bicycle was going at the rate of 18 miles an hour. The boy did not swear that he knew I was driving fast, but that the little machine, which was not in court, not examined or cross-examined, or tested, as he read it, and as he told it, showed his wheel was traveling at that rate. The policeman refused to testify that I was driving fast, but in answer to my request that he state whether my car was going at a high speed, he said: "I had no means to judge. I cannot say." I had left the Palmer house in Chicago in my machine and had driven at an even speed all the way, passing many policemen and was just 1 hour and 15 minutes reaching the spot on that deserted street where I was held up by order of that boy who had a speed-indicator to play with. With true Dogberian wisdom the justice, who acted as judge and prosecuting attorney, held me

guilty and fined me \$15 and costs. I was not permitted to have an officer go with me to the residence of a friend in Evanston, was not permitted to leave the station, but was held there a prisoner, like a common thief, until by telephone I succeeded in getting word to the wife of an Evanston friend, and she came and signed an appeal bond with me. No automobilist being arrested in Evanston should pay a fine. Let every one appeal. Fining automobilists is a rich business if they all pay. We are strong enough now to fight. Why should we pay fines unjustly levied against us? The newspapers are more to blame than all other causes for the vindictive arrests of automobilists. Witness that motorphobic, the Chicago Tribune. It denounces the whole class for the sins of a very few, but it never has been known to condemn the outrages perpetrated by police and constables and justice courts against law-abiding citizens who happen to ride in automobiles.—GEORGE F. WESTOVER.

CYLINDER WALL THICKNESS

Vandergrift, Pa.—Editor MOTOR AGE—Will you kindly advise me through the Readers' Clearing House how thick the walls of a cylinder of 4½-inch bore and 6-inch stroke should be on a gas engine to be run at 900 revolutions per minute?—J. M. W.

If the grade of iron is good the cylinder walls should be about 7/32-inch thick.



FACTORY OF THE REO MOTOR CAR CO. AT LANSING, MICH.

Glide Branch in Des Moines—The Bartholomew Co. has decided to open a Glide branch in Des Moines and will place S. W. Leonard in charge.

Reo Plant—Despite the fact that it has been in its new factory for a season the Reo Motor Car Co., of Lansing, Mich., is already finding itself crowded. The plant is an extensive one and convenient to the railroad.

Bigger Factory—The Standard Roller Bearing Co. has just started the erection of a brass and iron foundry, 60 by 125 feet, two stories in height. Its crucible steel casting plant started in operation last week, the size of this building being 60 by 95 feet.

To Help Kirkham—At a meeting of the stockholders of the Kirkham Motor Co., of Bath, N. Y., held recently, M. E. Shannon and Talcott W. Gould were selected from the stockholders to share the management of the company for the next 6 months with Charles Kirkham, the inventor of the motor.

May Patch Up Breach—A new application to have the Simplicities Auto Co., of Boston, thrown into the hands of a receiver has been filed with the supreme court. The company is not insolvent, but there is reported to be a serious disagreement among the partners and the stockholders. It is probable, though, that an agreement will be reached and a receivership avoided.

Columbia's Testing Crew—The testing crew of the Electric Vehicle Co. at the Hartford factory numbers a large crowd in the busy season. With the work of assembly just starting in on big lines the testing force is being enlarged from time to time, but the men pictured above number what is known as the old guard. Bert Holcomb, the long-distance road driver, is behind the wheel and at his side sits Pop Lull, one of the first men to drive a car professionally. Larry Duffie, who is boss of all Columbia testers, is the undersized man who sits on the battery box on the running board. With him are Fred Wright and Cap Townsend. Gene Mertens stands at the right, while the left position is held up by Pete Ballou, who has driven cars in all parts of America.

Every car made in the Columbia factory is tested from 200 to 1,000 miles by these men.

Goes to Sharon—The American Tri-Motor Co. will erect a plant at Sharon, Pa., for the manufacture of automobiles, and will be capitalized at \$500,000, it is reported.

Still Growing—For the third time this year the Du Brie Motor Co., of Detroit, has been forced to increase its capacity. The installation of more machinery will enable the company to turn out ten engines per day.

French Hustle—Lacoste & Battman, makers of the French runabout of that name, accomplished a novel feat recently. They took the parts of an 8-horsepower single-cylinder car and at a signal started workmen assembling the car. In exactly 3 hours 48 minutes later the machine was ready for service. Twelve minutes later M. Lacoste hopped in the car and drove from Paris to Bordeaux and back, covering the 750 miles in 61 hours 29 minutes, despite heavy roads.

In New Quarters—The Continental Caoutchouc Co. is now located in its new quarters at 43 Warren street, New York. The place consists of a double store front extending back 75 feet. The ground floor is used for offices and the first and second basements for stock and repair departments. The company has also opened branches in Boston, Buffalo and Cleveland.

In Trouble—Otto M. Knoblock and Frank Hoffman have been appointed joint receivers of the Charles A. Kaestner Mfg. Co., of South Bend, Ind., by the circuit court. They are to take care of all the property, machinery and equipment of the company. According to the complaint, which was filed by the St. Joseph Loan & Trust Co., of South Bend, the institution is in a bad way financially. The complaint recites that the Kaestner company is indebted to the trust company in the sum of \$13,000. The plaintiff says the defendant company has machinery and equipment of considerable value, which should be taken care of, as the company ceased doing business last Friday. The machinery is estimated to be worth about \$15,000. The company made automobile

engines and automobiles and automobile parts in the plant of the Miller-Knoblock Electric Co.

Jay Locates—After a long search Webb Jay, Chicago manager for the White branch, has found a location and after the first of the year will be at 240 Michigan avenue.

Receiver Named—Justice Amend, of the supreme court, has appointed Rudolph A. Seligman receiver for the Pioneer Automobile Campus Motor Co. of New York. Suit was brought by the National Battery Co., a judgment creditor for \$366.

Takes on Foreign Tire—The Harbourg Tire Co., of New York, has been organized to import and sell the Harbourg-Vien tire, made in Austria. It is announced that the New York Motor Co. was to have the selling agency, but this was denied by the latter concern.

Decauville Auxiliaries—Among the recent incorporations are several subsidiary companies to the Decauville Automobile Co. These are the Gaulois Tire Co., the Dac Supply Co., the Franklin Agency Co. and the Birdsall Mfg. Co., all of which are capitalized at \$500.

New Idea—The Mechanical Advisory Board has been incorporated at Chillicothe, O., with a capital stock of \$25,000, with the idea of giving expert opinion to inventors before they apply for patents, whether it can be manufactured at a profit and whether when manufactured it will be of use. The officers are: B. A. Gramm, president; B. W. Twyman, vice-president; Fred Biszantz, secretary and treasurer; Charles Elliott, chief engineer, and C. K. Probst, chief draughtsman. Mr. Gramm is manager of the Logan Construction Co.

Stanley Racer—The Stanley steam racer built for Ross for use at Ormond has a low-hung, beetle-shaped body, the frame only clearing the ground by 10½ inches. The body is made of whitewood and ash glued together and the turtle-back is a wooden framework covered with canvas. Only one engine is used, the burner being 30 inches and the boiler 10 inches more in diameter than the one on the large touring cars. The engine is set away aft and just ahead of it is the boiler. The driver sits directly ahead of this. A Stanley runabout and a touring car will also be sent south.

Tire Competition—The Pennsylvania Rubber Co. announces a tire economy test for \$1,000 in cash to the owners and chauffeurs who go through the year on Pennsylvania clincher tires with the least tire expense per running mile. The first prize is \$500. The conditions state that competitors may enter cars at any time during the year, but cannot hand in their records before the end of December. The car must have traveled not less than 2,500 miles during the year. The distance traveled must be measured by an accurate odometer. No bands or protective devices of any kind may be used on the tires, except that one band, covering not more than 12 inches of the tread, may be used temporarily if necessary on account of any injury to the tire. Repairs must be charged at the rates charged by the company, and all repairs must be reported in detail at the close of the year. Each competitor must notify the company of

his intention of entering the competition and must give the number of miles registered by his odometer at the time of entering.

Bailey Connects—Fred T. Bailey, an associate of Oldfield on the grand circuit, has been made sales manager of the automobile department of the Harris Oil Co., of Providence.

New Western Factory—The Hornecker Motor Mfg. Co. is building a plant at Whiting, Ind., to manufacture motor cycles with side attachments for carrying passengers. Prominent Whiting and Chicago men are interested in the enterprise.

Miller's Branches—Charles E. Miller, of New York, manufacturer and jobber of sundries, has arranged for the establishment of branch houses at Detroit and Buffalo, in addition to those already running at Philadelphia, Cleveland and Boston.

Factory in Evansville—The Windsor Automobile Co., recently incorporated under the laws of South Dakota and licensed to operate in Indiana, has located its factory at Evansville, Ind., W. M. Copeland being treasurer of the concern instead of Indiana agent as reported.

Chicago Movements—R. P. Rice, formerly of the Holmes-Schmidt company, has been made assistant manager of the Chicago Ford branch. A. J. Nicolet has been placed in charge of the stockyards branch of Ralph Temple, and F. L. Kimball has gone with the McDuffee Automobile Co.

Badgers Busy—The Auto Rapid Transit Co. has been organized at La Crosse, Wis., with a capital stock of \$25,000. The company will start a rapid delivery system in the city, a passenger service between the south and north sides, and will also conduct a renting and livery business. Plans are being drawn for the erection of a fireproof garage. The officers and directors are A. J. Stephenson, president; W. J. Brayton, secretary, and Phillip McMahan, treasurer.

Adland Garage in Chicago—The Adland Motor Co., Chicago agent for the Lambert friction drive car, is building a garage at 900-902 West Madison street. This location is a convenient one for west side motorists, being but a few steps removed from Oakley, Washington and Jackson boulevards. On the ground floor the garage proper occupies a floor space of 50 by 195 feet, with capacity for handling sixty cars. A repair shop will be operated in connection with the garage, which will be completed within 60 days.

Save on Gasoline—New York garage keepers are planning to combine in the purchase of gasoline by the carload. Under present conditions buying gasoline in barrel lots costs 13 cents a gallon, delivered to the garage. Five big garage owners, who use an average of 1,000 gallons a day during the busy season, which would cost about \$650, have combined forces and will buy the gasoline in carload lots at the market price of 5½ cents a gallon, which will make a saving of \$275 a day, less the cost of carting, which, it is figured, will average about \$50 a day. With five garages using 5,000 gallons of gasoline per day, which would mean only an average of 5 gallons per car for each of the 200 cars that might be stored with them, it

gives a general idea of the great quantity of gasoline being used in New York in motor cars.

In Other Lands—The Franklin people have recently arranged for representation in the City of Mexico, Yucatan, Porto Rico and Canada.

Name Changed—The Toledo Storage Battery Co., of Toledo, O., has changed the name of the Ex-Cello battery to the Miller. The concern contemplates adding new machinery and more force after the first of the year.

Helps Importers—President Mabley, of the importers' salon, has concluded an arrangement with Collector Stranahan and Appraiser Whitehead, of the port of New York, by which their foreign cars arriving a few days before the show will be brought direct to the garden before being subjected to the inspection of the customs officials. It will save much valuable time, especially on those cars arriving on steamers getting here at the eleventh hour.

Berliet Outlook—Two hundred four-cylinder Berliet cars of 24-30 horsepower and 40-50 horsepower, is the 1906 output announced by the American Locomotive Co., of Providence, R. I., which will turn over these cars simultaneously with the Berliet factory in France. Albert Otto is manager of the new department of the company, which has built thousands of locomotives, and with him is associated James Joyce, a veteran bicycle tradesman, recently with the Electric Vehicle Co.

Smooth Trick—W. H. Durphy, manager of the Chicago branch of the Electric Vehicle Co., is looking for a youth calling himself Sid Kahn who flim-flammed the branch for a \$63 tire. Just before Christmas someone called up the store, stating he was the private secretary of John J. Mitchell, the banker, who owns a Columbia, that Mr. Mitchell wanted a new tire and that his chauffeur would call for it. Sure enough, a youngster clad in the conventional chauffeur togs came and got the tire, signed his name to a receipt book and walked out. Later Manager Durphy found out he had been worked and that Mr. Mitchell had not ordered any tire. Warrants are now out for the con man. It's a game that would catch almost any deal-

er, and the wonder is that more have not been worked in this manner.

For Demonstration—The Packard and Buick cars have been selected for demonstration at the Long Island Automobile Club next Friday.

Now Mrs. T. B. Van Alstyn—T. Butler Van Alstyn, general sales manager of the St. Louis Motor Car Co., is now on his honeymoon, the wedding taking place at Binghamton, N. Y., and the bride formerly Miss Tina M. Porter, of St. Louis.

Co-Operative Garage—The Atwood Automobile Co., of Toledo, O., was born last week, having been incorporated under the provisions of the Ohio laws with an authorized capital stock of \$40,000. The garage will be conducted on the co-operative plan, and will be located in the residence section of the city. A. A. Atwood is at the head of the new concern. The Pope-Waverly, Franklin and Packard will be handled.

Wayne's New Factory—The new factory building of the Wayne Automobile Co. is to be located at the northwest corner of Piquette avenue and Brush street, Detroit. The main building will be 400 feet on Brush street and 300 feet on Piquette avenue and will be three stories high. The testing building will be back of the main building and will be 36 by 100 feet, and the boiler and engine room will be 30 by 45 feet, with a covered loading platform 150 by 16 feet. There will also be an enclosed track for testing purposes. Part of the plant will be ready for occupancy by the middle of next month.

Wilkie at Wilkesbarre—Eddie Wilkie, of the Pennsylvania Electric Vehicle Co., of Philadelphia, opened the eyes of the Wilkesbarreites last week by breaking the record up Wilkesbarre mountain in a 22-horsepower Buick. He reduced the figures to 8 minutes flat, the best previous, 8 minutes 4 seconds, having been held by a 50-horsepower car. Wilkie also performed stunts on all the other stiff climbs about the town, and wound up by carrying a millionaire coal operator, and two other passengers all the way to Hazleton, over two mountains, on the high gear—over 30 miles—in a trifle under 2 hours. The return trip to Philadelphia was made in 7 hours 50 minutes.



TESTING CREW OF ELECTRIC VEHICLE CO. AT HARTFORD

BRIEF BUSINESS ANNOUNCEMENTS

Chicago—The Branstetter Auto Co., has changed its name to the Mitchell Co.

Cleveland, O.—The Baker Electric Co. is to have a new factory near Edgewater Park.

Racine, Wis.—The Mitchell Motor Car Co. has put up a 205 by 80 feet addition to its machine shop.

Morristown, N. J.—The W. H. Dutton Co. will soon take possession of its new garage on Washington street.

Elkhart, Ind.—Plans are being drawn for a new garage to be built at Main and Jefferson streets for M. Landon.

Bay Shore, L. I.—Howard P. Foster has secured the exclusive right for the Wayne car in Brooklyn and Long Island.

Kansas City, Mo.—The Glide will be sold in Kansas City and vicinity next year by the Ferguson Implement Co.

New York—A. R. Welch, of the Welch Motor Co., will soon announce the location of a new branch to be managed by G. L. Lighthall.

San Francisco, Cal.—The Martland Automobile Co., of Los Angeles, and the Gump Automobile Co., of Los Angeles, will handle the Glide on the Pacific coast.

Springfield, Mass.—The automobile department of the Stevens Arms & Tool Co. is now located in the former factory of A. G. Spalding & Brothers, at Chicopee Falls.

New York—Rudolph A. Seligman has been appointed receiver for the Pioneer Automobile Co., formerly of 54 West Forty-third street, which recently went out of business.

New York—Another foreign car which will soon be placed on the market is the Roselle, which is named after the inventor, M. Roselle, who was formerly connected with the Peugeot company.

Philadelphia, Pa.—Frank P. Walton, formerly of the Kelsey Motor Car Co., has assumed the management of the Hamilton Auto Co. at 206 North Broad street. This company will handle the Stoddard-Dayton line in this city.

Detroit, Mich.—The City Machine & Mfg. Co. is a new firm, located at 9-13 Orchard street. It will manufacture automobile wheels. In addition it will make a specialty of general repairing and automobile work.

Buffalo, N. Y.—A new idea for the problem of bringing buyers and sellers of second-hand cars has been worked out by a new concern known as the Automobile Clearing Co. Those having second-hand cars for sale will be charged a small fee for registration.

Marysville, O.—The Marysville Motor Co. has been organized to manufacture automobiles. Officers of the company are as follows: President, H. A. Stevenson; vice-president and secretary, George Rausch; treasurer; L. T. Henderson, Harry Tarkington, who was superintendent of

the Sommer company's factory in Detroit, will be general manager.

Bloomfield, N. J.—The Torbenson Motor Car Co. has purchased the property at 610 Bloomfield avenue, and after alterations are completed will occupy the building for



Brooklyn—The Macbeth Bros. Co. has been incorporated with a capital stock of \$10,000, and will engage in the manufacture of wagons, automobiles, etc.

Chicago—The Northern Motor Car Co. has been incorporated with a capital stock of \$15,000, and will engage in the manufacture of automobiles.

New York—The Twombly Motor Car Co. has filed articles of incorporation, with a capital stock of \$1,000,000.

Hartford, Conn.—Among the new incorporations is that of the Middletown Automobile Body Co., which has a capital stock of about \$50,000, and will engage in the manufacture of parts of motor vehicles.

Orange, N. J.—The Automotor Transfer & Storage Co., has been incorporated with a capital stock of \$45,000, to engage in the business of storage of carriages and motor vehicles.

Lansing, Mich.—Articles of association have been filed by the Motor Car Co., capitalized at \$15,000.

New Haven, Conn.—With a capital stock of \$20,000, a company has been incorporated to manufacture and deal in automobiles. It will be known as the Central Automobile Co.

Dayton, O.—The Bordersesch & Glancy Automobile Co. has been incorporated with a capital stock of \$25,000.

New York—The Lock-Switch Mfg. Co. has been incorporated with a capital stock of \$25,000, and will manufacture and deal in automobiles.

New Orleans—The Tracy Automobilium, Limited, has been incorporated with a capital stock of \$50,000, and will engage in the manufacture, buying, selling, repairing, renting and storing of automobiles, and all kinds of vehicles and vessels propelled by power, more especially by steam, gas, gasoline, etc.

New York—The Perfection Reversing Gear & Supply Co. has been incorporated with a capital stock of \$50,000, and will manufacture gears, machinery, motors, etc.

Augusta, Me.—The Pontiac Motor Car Co. has been incorporated with a capital stock of \$25,000, and will deal in automobiles.

Indianapolis—The American Motor Car Co. has been incorporated with a capital stock of \$25,000, and will make, buy and repair automobiles, motor cars, etc.

New York—The E. T. Kimball Co. has been incorporated to manufacture motors, engines, etc. Capital stock, \$10,000.

Milwaukee—The Welch-Estberg Co. has been incorporated with a capital stock of \$50,000, and will engage in the manufacture of automobiles and motor cars.

Buffalo—The Motor Vehicle Garage Co., of Buffalo, has been incorporated to maintain a garage. Capital stock is \$20,000.

Detroit, Mich.—The Motorcar Co. has filed articles of incorporation, the capital stock being \$100,000. The stockholders are Frank C. Caughay, Fred Postal, Randall A. Palmer, George A. Young and Harry C. Radford.

Evansville, Ind.—The Windsor Automobile Co., of South Dakota, has been incorporated to manufacture automobiles. Capital stock, \$250,000, all held in Indiana, by Albert F. Kargen, John C. Zutt and W. M. Copeland.

Waukesha, Wis.—The Welsh-Estberg Co. has been incorporated for \$50,000 by Harrison S. Green, Milwaukee, and William O. and Charles C. Welch of Waukesha. It will manufacture automobiles in Milwaukee.

the manufacture of motors and gears for touring automobiles and trucks.

Grand Forks, N. D.—George E. Duis has secured the Glide line for the coming season.

DeKalb, Ill.—Sheets & Knodle have taken up the agency for the Mitchell car for 1906 exclusively.

New Orleans, La.—The Medina Stamping & Machine Co. has taken the Ford agency for Orleans county.

Passaic, N. J.—L. P. Lonone has made arrangements to handle the Rainier in Passaic and Bergen counties.

New York—A contract has been signed with Charles L. Seeger, giving him the agency for the Panhard in Mexico.

New York—Archer & Co. have secured the agency for the Hotchkiss cars and will shortly open a salesroom on Broadway near Fiftieth street.

Madison, Wis.—Daniel H. Scanlon, of Chicago, has taken the agency for the White steamer for this city and Jamesville and will establish headquarters here.

Utica, N. Y.—C. H. Childs & Co. are about to open a new garage at the corner of Cornelia and Cooper streets, their old establishment at 126 Lafayette street being too small.

Detroit, Mich.—The Wayne will be represented in Germany by Leopold, Robert & Co., Nidderstrasse, Frankfurt, A. M. Orlando Baker will handle the Wayne in West Alexandria, O.

Milwaukee—A. D. Meiselbach, formerly a large manufacturer of bicycles, has perfected an automobile delivery wagon. A factory will be built in North Milwaukee, where this machine will be manufactured.

Newark, N. J.—Alexander Ostler, formerly with the Motor Car Co. of New Jersey, and Delancy Zane, formerly with George W. Condon, have opened a repair shop and garage on Crawford street near Halsey.

Newark, N. J.—Herbert Austin, a bicycle dealer, has decided to enter the automobile business, having secured the agency for the Ford. His territory includes Essex, Morris, Somerset and Union counties, and may be extended to the whole state.

Pittsburg, Pa.—B. L. Brown, the manager of the electrical department of the Standard Automobile Co., has organized a new company to be known as the B. L. Brown Co. It will occupy the old establishment of the Hiland Automobile Co. and will take possession February 1.

Newark, N. J.—J. B. Ryalls, manager of the Pope Mfg. Co. for northern New Jersey, has made arrangements to become agent for a French car called the Mierseet, in addition to handling the Pope line. His territory with the new car includes Canada and South America, as well as the United States. He expects to have his samples in his garage in a short time.



American Motor League

OFFICERS

ISAAC B. POTTER, President.
Potter Building, New York.
CHARLES E. DURYEA, First Vice-Pres., Reading, Pa.
JOHN A. HAWKINS, Second Vice-President, Pittsburg, Pa.
FRANK A. EGAN, Secretary, 132 Nassau St., New York.
FREDERICK B. HILL, Treasurer, 82 Binford St., Boston.

National Headquarters
Vanderbilt Building, New York

THIS LEAGUE

Is Now Collecting Route Information

covering all automobile routes in the important states and will publish road books for motor car users as fast as complete information is received. The A. M. L. is the only organization engaged in this work, and it invites the co-operation of all persons interested. For full information and membership blanks address American Motor League, Vanderbilt Building, New York City.

Of course, every reader of MOTOR AGE has read Mr. Duryea's serial articles on "Roadside Troubles." They were written especially for the members of the A. M. L., and the subject has been handled in a masterly way by an author whose long experience and fine technical knowledge have enabled him to write from the standpoint of authority. It was announced that when these articles were published they would be reproduced in book form and a copy given free to each member of the league.

"Roadside Troubles" is now in press. Next week the sheets will be in the hands of the binder, and every effort will be made to distribute copies at the time of the coming automobile shows. That league members may be informed of the scope and character of the subjects treated we print here the chapter headings of the twenty separate chapters.

Chapter I—Selecting a machine—Points to be considered—Electric, steam and gasoline vehicles—Advantages of the gasoline system—Power and strength for rough and hilly roads—Ample clearance—Large wheels.

Chapter II—How weight and strength should be distributed—Importance of careful design—Select a powerful motor—All parts of car and motor should be accessible—Durability—Wearing surfaces must be ample—Avoid "new models"—Flexibility, how to test—Flexible car is the most durable.

Chapter III—The capable machine—Power and strength must combine—Importance of simplicity—The foolish demonstrator—Safety; how it can be secured—Low center of gravity—Parts that give trouble—Protecting the mechanism—Large wheels, large tires, flexible springs and long base for bad roads.

Chapter IV—Cleaning the vehicle—When and how to wash—Keep machine in a light, dry, well ventilated place—Hints to the operator—Have patience; know your vehicle—Examine all parts—Study cause and effect—The pleasure of knowing.

Chapter V—Importance of daily inspection—Knowledge is power—All may and should learn to know the motor car—The steamer; steam vehicle must be understood; features needing most attention—Practical hints and directions.

Chapter VI—The electric car—Its main defect—Care of the electric vehicle—All parts should be understood—Keeping clean—The meters—The batteries—The electrolyte—Practical hints and suggestions—Testing and charging.

Chapter VII—Gasoline; its qualities and uses—Various grades—The proper mixture—The hydrometer—Kerosene may be used—

Gasoline not explosive—Possible danger—Gasoline vapor—How to secure safety—Avoid spilling—What to do in case of fire.

Chapter VIII—Storing gasoline—How to prevent waste—Water in gasoline—Keep out impurities—Protecting the carburetor—Combustion troubles—Failure to ignite—Advancing the spark—Three essentials—Testing compression—Where to look for leaks—Valve action.

Chapter IX—Ignition; rapid improvements—Two systems in common use—The primary system—The jump spark—Plugs; their defects; practical hints for care and cleaning—Spacing the points—Testing the plug—Testing the cells—The voltmeter and the ammeter—The vibrator—Importance of proper adjustment—Vibrator points should be large.

Chapter X—Ignition continued—The make-and-break spark; its advantages—Magnets; their value and reliability—Generators—Most common in jump spark work—Primary and secondary methods compared—Batteries; number of cells—Economy in the use and arrangement of cells—Study of electricity recommended.

Chapter XI—The mixture—Carburetors—Valve movement; exhaust valves and inlet valves—Advantages of multiple cylinders—Lubrication; its high importance—Good oil always cheapest—Comparison of oils—How to lubricate—Oiling devices—Weather effects—Graphite as a lubricant—Lost power—Seized bearing—Inspection.

Chapter XII—Tires—Watch them—Danger of driving on a flat tire—Testing for leaks—Timely hints—Rubber solution; how to use it—Patching the tire—Oil on rubber—Jacks—Cleaning the hands—Large tires recommended; reasons—Avoid mud—The use of tires in winter—Cold season less trying than summer—Cars not in use should be lifted on jacks.

Chapter XIII—General hints—Dry axle; curing its troubles—Back firing; how corrected—Buzzing of the coil—Bad battery—Brake troubles; how to overcome them—Bumping; generally caused by deflated tire—Various noises and their sources—Broken chain; what to do—Broken springs.

Chapter XIV—Tire failures—What to do

when the tire bursts—Carburetor and vaporizer troubles; clogging; freezing—Rich and poor mixtures—How to correct them—Leaky floats; testing and repairing—The coil—Water-soaked coils—Causes and cures—Boiling the coil in paraffine—High tension coils must be kept dry—Clatter in the vehicle—Strange noises must be investigated.

Chapter XV—Engine troubles—Frozen water jacket—Faulty lubrication—Repairing cracked jacket—Circulation obstructed pipes—Harmful results—Gaskets should be thin—How applied—Woven wire and asbestos gaskets—Lead and copper gaskets—The governor—Thawing frozen pipes—Ice in the gasoline—Ice in the feed pipe—Lubrication; constant vigilance required.

Chapter XVI—Engine troubles continued—Unpleasant odors; what they indicate—Leaks must be repaired at once—Overheating; how caused—Remedies—Starting troubles—Advantages of multiple cylinders—Various causes for non-starting—Inspection necessary—Cold weather troubles—Warming the gasoline and thawing ice in pipes—How to proceed—Formula for starting.

Chapter XVII—When the engine stops—The warning—What to do—Testing for trouble—Directions in detail—Vehicle should be fixed before starting out—Battery defects—How batteries run down—Tool kits; a friend in need—What tools are required—The tire repair outfit; its importance—Should always be carried—Extra parts; suggestions—Manufacturers will always advise.

Chapter XVIII—Towing the vehicle; sometimes necessary—How it should be done—Freezing the axle—Pushing the vehicle—Towing by use of rope—The wrong and the right way—How to proceed under different conditions—Knots; the fundamental object in knot tying—How to tie useful knots in the most simple and effective way—Useful knots shown by illustration.

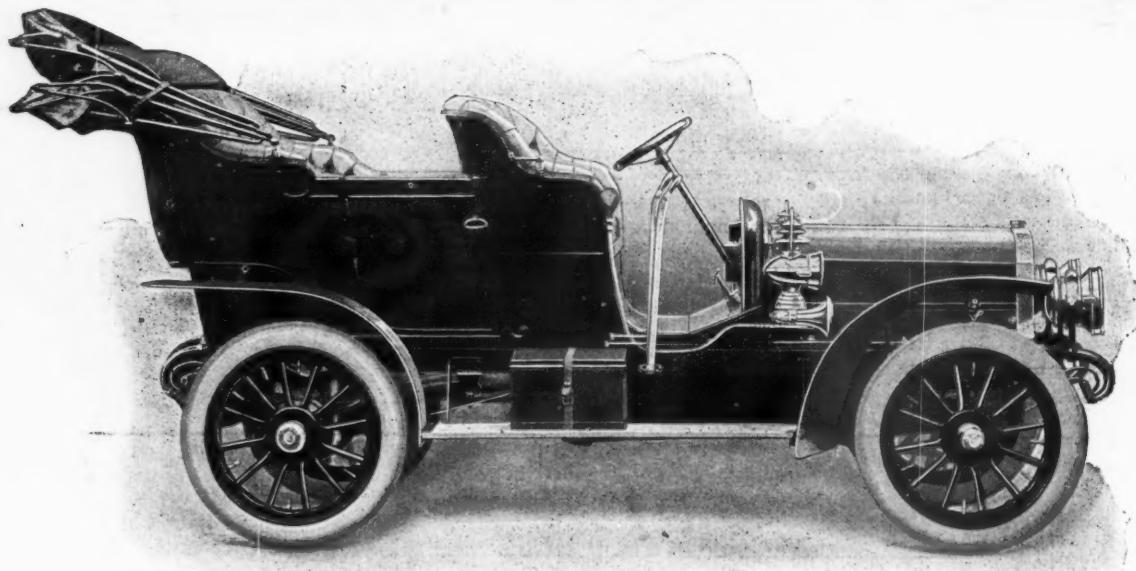
Chapter XIX—More about knots and tying—The slip knot—Sailor's knot—Square knot—Weaver's knot—A convenient knot described—Hitches—Splices—The splicing of wires—The lineman's splice—Flexible wires and stiff wires—Wire-cutting pliers should be used—Breaking wires—Hints in brief.

Chapter XX—Filling tanks and oil cups without a funnel—How to pour oil—The paper funnel for emergency use—Care of the hands—Keep the hands smooth—Glycerine and water recommended—Soaping the hands before work—Strong soaps roughen the skin—Abrasive soaps often preferred—Sawdust and turpentine—Ammonia—Cuffs; hints for keeping clean—Emergency jacks.

FREE COPY TO EACH MEMBER

Each member of the A. M. L. will receive by mail a free copy of "Roadside Troubles." This applies to all members in good standing at the time of publication. The list is now being made up and wrappers addressed. No initiation fee. Dues, \$2 a year.

WINTON MODEL-K



WHAT DOES IT WEIGH?

That's a question often asked by prospective buyers of automobiles.

And it's a proper question, too.

Because, if the weight is not properly proportioned to the car's size and carrying capacity, the buyer gets into trouble.

So you must consider WEIGHT.

Some automobile builders take chances on light weights, making the buyer run the risk of breakdowns and perhaps serious accidents.

That's bad business, but it's true.

Keep that in mind when buying and don't be misled by any siren song of how much power you save in running a skeleton-weight motor car.

Gasoline and horse-power are cheap compared with HUMAN LIFE.

You can richly afford to waste power, if your car is so substantially built that,

no matter how rough, or rocky or hilly the road, your life and limb are never in danger.

But you are not compelled to waste power to secure absolute safety in motoring.

Get a Winton Model K.

Every kind of metal used in the Winton Model K is tested in our own plant, on our giant Riehle Testing Machine, before we put a pound of it into use.

These tests show how many pounds pressure or pull to the square inch Winton Model K metals withstand before cracking or breaking.

This testing machine exerts a strain up to 200,000 pounds (100 tons) to the square inch. Think of it!

We don't gamble on weights. We insure your safety by using material that will live through any strain.

We cut out every possible waste of

power by grinding all bearings to the smoothness of plate glass.

And we put into the car an engine big enough and powerful enough to drive the car and carry its full load of passengers at full speed, without damage to engine or danger to passengers.

If we wanted to take chances—at your risk—and save money in manufacture, we could reduce the weight of Model K at least 350 pounds.

But, every pound of weight in the Winton Model K is there because it represents honest construction, stability and utter absence of danger to you when you ride in it.

Look at our massive Manganese Bronze Front Axle. That's a fair specimen of Winton construction. That axle weighs something. And it's an axle that won't let down under you, no matter how fast you go or how many passengers you carry.

MODEL K WINTON.—Four vertical, "water-cooled" cylinders, 30 H. P. or more. Quiet running. Abundant reserve power. Velvety, non-jar, non-shock, non-breakable transmission. Flexible speed control. Shooting oiler. Exclusive Twin Springs. Easy Riding. And every other feature that a real high-grade car should have. \$2500 f. o. b. Cleveland. Compare it with cars selling at \$3500 and more.

THE WINTON MOTOR CARRIAGE CO.
CLEVELAND, O.

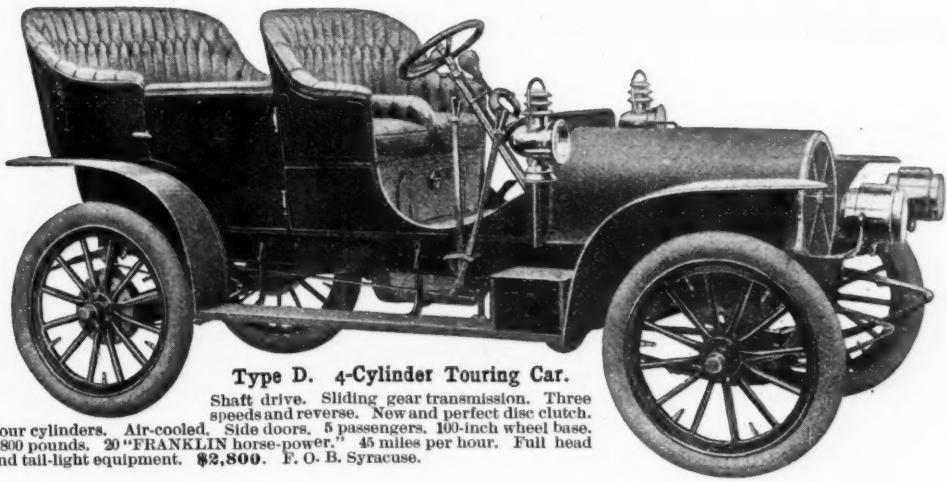
Member
A.L.A.M.

U. S. A.

CATALOG NO. 2 IS READY

We will exhibit in New York at the Madison Square Garden Show ONLY, January 13-20, 1906

FRANKLIN



Type D. 4-Cylinder Touring Car.

Shaft drive. Sliding gear transmission. Three speeds and reverse. New and perfect disc clutch.

Four cylinders. Air-cooled. Side doors. 5 passengers. 100-inch wheel base. 1,800 pounds. 20 "FRANKLIN horse-power." 45 miles per hour. Full head and tail-light equipment. \$2,800. F. O. B. Syracuse.

This is the most surprising car on the market. Nobody can believe what it will do until he tries it. No "30-horse" can do more under any conditions; and no car of any power or price—built anywhere, can do more with five people on American country roads.

Its perfect cooling light-weight and non-jarring qualities enable it to maintain speed indefinitely, and over poor and hilly roads; and make it an extraordinary climber.

It belongs in the "big-car" class; has all the comfort, roominess and style; without the weight, danger and excessive useless cost.

Franklin cars are built on principles that are like diamonds—they can never become old-fashioned. They are becoming more widely recognized and accepted. They are growing more and more into vogue every day.

Last year's Franklins have proven so successful that imitations of them will appear next year and for many years in many other cars. Even a second-hand Franklin is a year or two ahead of the times.

Another point—a most important one: Franklins are made—in every part, of the most suitable and durable materials; and are put together in the most substantial and effective manner that money can pay for. They will not only remain in style but they will continue to do the work.

The first Franklin ever put on the market in 1902 is running today—and running satisfactorily. A Franklin's years of active usefulness have never been measured.

That is why a second-hand Franklin is a first-rate property, commands more money than many first-hand cars of equal pretensions. The value is there; and it is known.

Four Models for 1906

4-Cylinder Runabout 4-Cylinder Light Touring Car 4-Cylinder Touring Car 6-Cylinder Touring Car

We exhibit at Madison Square Garden, New York, January 13-20, 1906

H. H. FRANKLIN MFG. CO., SYRACUSE, N. Y. M. A. L. A. M.

The Six-Cylinder Ford

"Always a year or two ahead." When the single-cylinder car was "it," Henry Ford produced a double-cylinder opposed motor, more powerful and at a lower price.

When the automobile trade finally awakened to the possibilities of the two-cylinder opposed motor, Mr. Ford produced a four-cylinder car at \$2,000 that was in a class by itself, the public having been taught to believe that such a car could only be produced at a fabulous price.

And now, having exhausted the possibilities of the four-cylinder car in a touring car class, he has introduced it into the Runabout class, and in addition offers a six-cylinder car that is proportionately as far in advance of all competition as his first double opposed motor.

This is a wonderful car.

First, its six cylinders, with 40 horsepower, give a latitude of speed never before accomplished in a car of its class and weight, 2,000 pounds. From four miles per hour on a high-gear up to 50 miles.

While one cylinder of this car will develop sufficient power to drive it along an ordinary asphalt pavement, the whole six cylinders inspire the driver with the confidence that there is an enormous latent energy in his motor, ready for any new demand without overloading the motor, making it the easiest controlled and most flexible automobile motor ever built.

When you have seen this motor in operation you will fully appreciate that we have the smoothest running automobile motor in the world.

Price, \$2500.00

The Ford Four-Cylinder Runabout

It is a fact that thousands of these cars are in course of construction.

Like all Ford cars, this one is a radical departure from previous and popularly-accepted designs, and there is a reason behind every radical idea.

Henry Ford built a four-cylinder engine for his Runabout with fewer parts than the old-fashioned single-cylinder engine had, and the Ford Motor Co. have an enormous factory that does nothing but build motors for this Runabout, with a capacity of 100 complete engines every day.

The whole thing is very simple when you go about it right.

This is why we can build the Ford four-cylinder Runabout for less than \$500.00.

**We are making 40,000 cylinders,
10,000 engines,
40,000 wheels,
20,000 axles,
10,000 bodies,
10,000 of every part that goes into the car.**

Think of it! Such quantities were never heard of before. We buy 40,000 spark plugs—10,000 spark coils—40,000 tires—all exactly alike.

The first Runabout (Model A) we built cost \$30,000—yet we sold duplicates of that model for \$750.00. It is the quantity that counts.

Ford Motor Company, Detroit

Member American Motor Car Manufacturers' Association, Chicago

Branches: 147-149-151-153 Columbus Ave., BOSTON; 1723 Broadway, NEW YORK; 727 Main St., BUFFALO; Broad and Buttonwood Sts., PHILADELPHIA; 1413 Michigan Ave., CHICAGO; CLEVELAND and KANSAS CITY

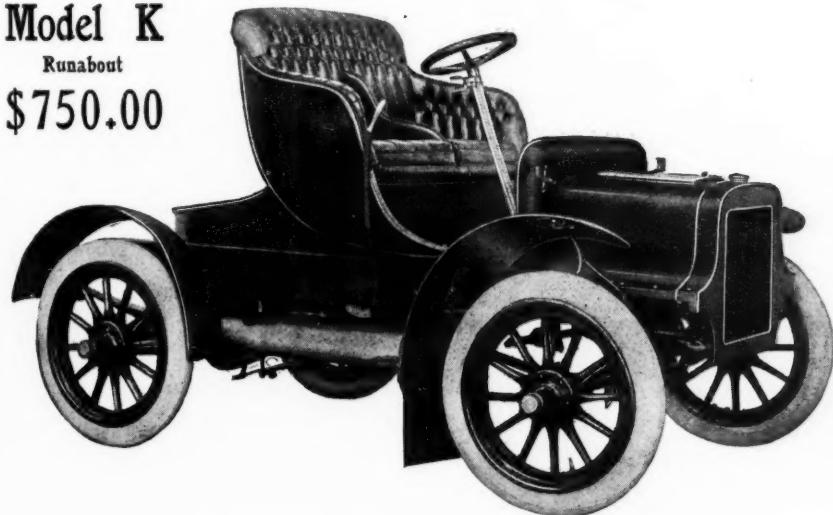
CANADIAN TRADE supplied by FORD MOTOR COMPANY of Canada, Ltd., Walkerville, Ontario

1906 Single Cylinder Cadillacs

Motor, single cylinder, four cycle 5 in. x 5 in. Ten H. P. water cooled. Copper water jacket. Mechanical pump feed lubricator. Jump spark ignition, Planetary transmission, two speeds forward and reverse.

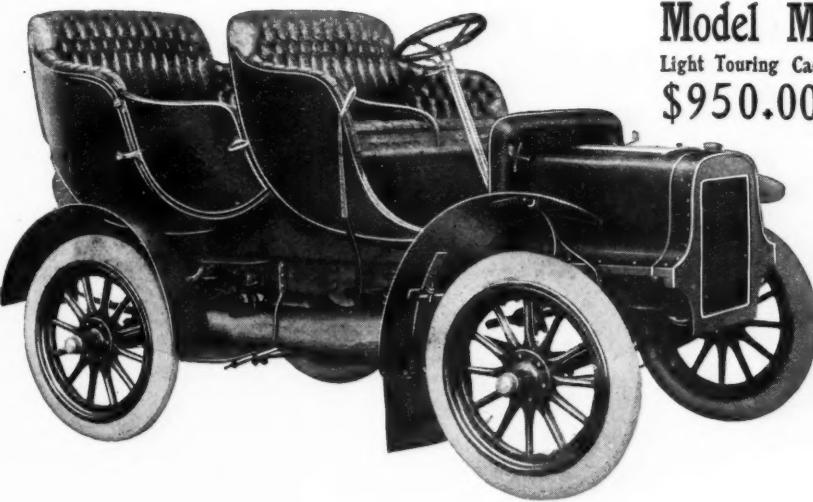
Pressed steel frame, channel pattern. Brake on extra large differential drums. Chain drive. Three spring suspension, rocker joint on front spring, more than doubling spring efficiency. Wheel base 76 inches. Tires, 30x3 1-2 on Model M, 28x3 on Model K. Bodies, Victoria pattern, strikingly beautiful. Pressed steel hollow dash.

Model K
Runabout
\$750.00



Members of Association Licensed Automobile Manufacturers.

When Writing to Advertisers, Please Mention Motor Age.



Model M
Light Touring Car
\$950.00

Finish, purple lake (a deep, rich wine color) on body panels and doors with light carmine striping. Dark carmine running gear. All parts thoroughly interchangeable. Cadillac quality throughout offering values never before equaled.

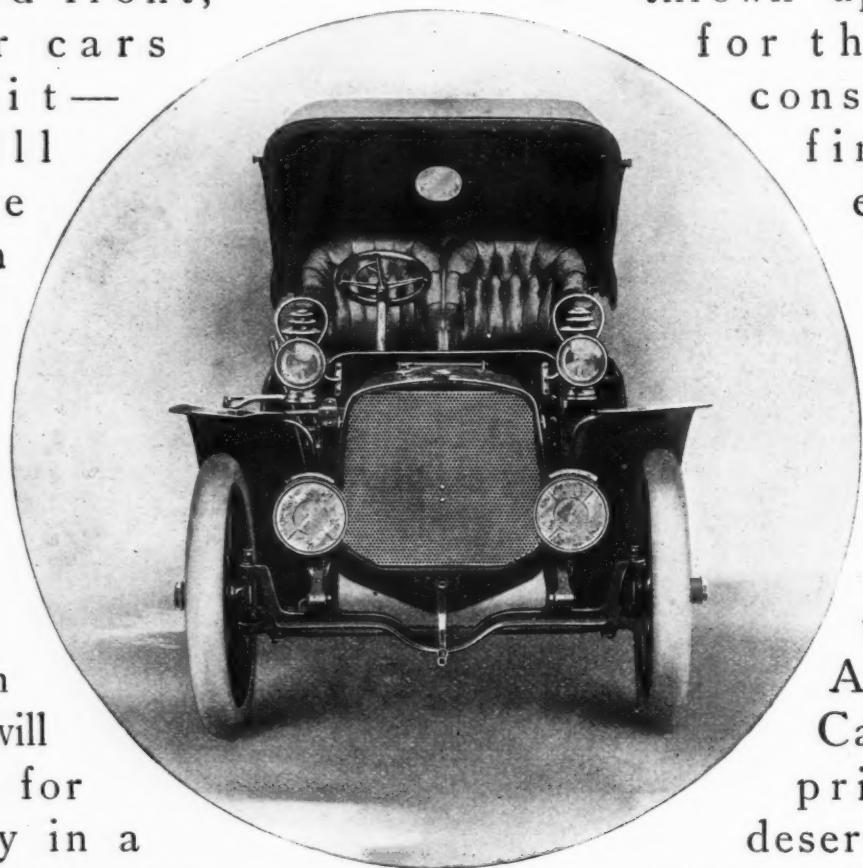
Our four cylinder line consists of Model H. 30 H. P. Touring Car at \$2500. Runabout at \$2400 and Coupe at \$3000. Also Model L. 40 H. P. Touring Car at \$3750 and Limousine at \$5000. These will be announced in detail later and exhibited at New York at Madison Square only, also at the Chicago Show.

Cadillac Motor Car Company DETROIT,
MICH.

A GOOD FRONT

We believe in putting up a good front, and our cars show it— as it will also be shown in our New Building at Fifty-fifth St. and Broadway, which we hope will be ready for occupancy in a few days, and where we will have a continuous plate glass corner front, permitting LOZIER MOTOR CARS to be shown to the best possible advantage. And they will stand all

the light that can be thrown upon them, for their fine construction, finish and equipment is such as invites the very closest inspection. The Lozier Car is the very largest American Car, and in price it is deservedly the highest. We are now delivering Limousines, Landaulets, and Touring Cars, 35 Horse-power, Type C, 1906 Model, and every owner of a LOZIER MOTOR CAR is one of experience who has at last found the ideal in our product.



THE LOZIER MOTOR COMPANY

Temporary Quarters at R. M. Stiver's Carriage Room, 19 W. 62nd St., New York City

LThe working out of a new principle of design as has been done in the Stevens-Duryea was a big achievement, so big that the public would have been tolerant with us if we had made a few errors in the application. In fact, most of those who have been watching the Stevens-Duryea during the year of 1905 were quite confident that such errors would show up before the season was half over. However, the makers of the Stevens-Duryea deserve unusual credit, for they not only perfected a new principle, but they got the *application* right in every detail the *first time they tried*. As a result we come before the public for 1906 with not a single excuse to offer for our 1905 product; and furthermore, we wish to direct attention to the fact that not a single one of our claims about its good features as expressed in our advertising or descriptive matter during 1905 was, after a season's use, proven inaccurate or overdrawn in the slightest degree. And, considering the many unequivocal statements we have made during the past year, the above record is without a parallel.

J. STEVENS ARMS & TOOL CO.
Makers of the "TWENTIETH CENTURY HUSTLER"
705 MAIN STREET CHICOPEE FALLS, MASS.

Member Association Licensed Automobile Manufacturers.

The
Queen

\$2000

One of Our Three New Models

MOTOR—4-Cylinder—26-28-H.P. **FRONT AXLE**—Solid-forged.
DRIVE—Shaft Bevel Gear. **GROUND PARTS**—All Cylinders, Pistons, Piston Ring, Crank Shaft, Valves, Universal Coupling and Transmission Shafts.
FRAME—Pressed Steel.
WHEELS—32 x 4.
WHEEL BASE—101 inches.
TRANSMISSION—Sliding Gear. **EQUIPMENT**—Five Lamps, Horn, Tools and Storage Battery.

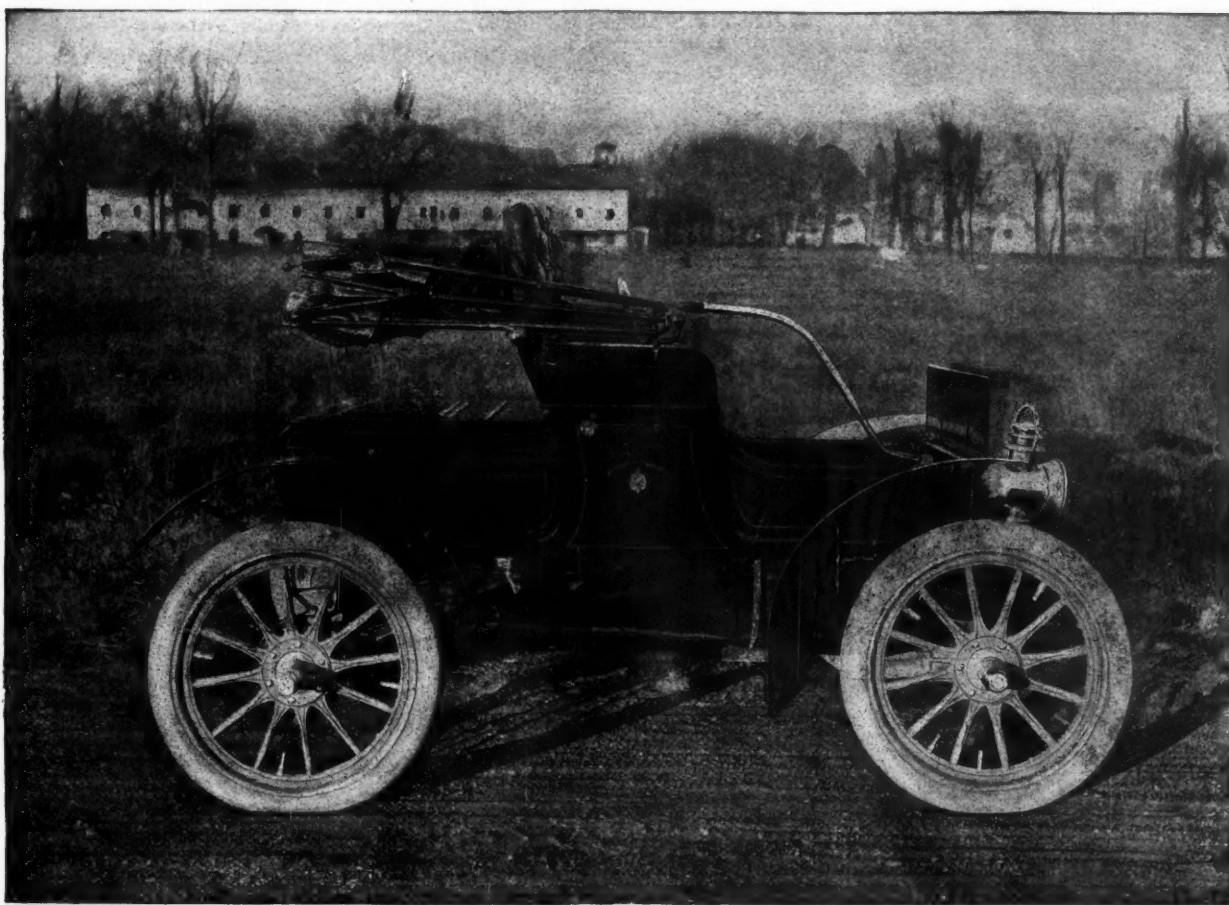
We also have an 18-H. P., Two-cylinder Touring Car with Detachable Side door Tonneau, listing at \$1,100—and a Runabout 12-H.P. at \$800.

Write us for complete details and agency proposition.

C. H. BLOMSTROM MOTOR CO., Detroit, Mich.

New York Agents, Majestic Auto Co., Cor. 54th & Broadway Chicago Agents, Branstetter Motor Co., 1337 Michigan Ave.

OLDSMOBILE



Standard Runabout Model "B" Price \$650

For 1906 we have brought out, in addition to our well-known curved dash runabout (the "you see them wherever you go" kind), a straight dash or "piano box" runabout, which we sell at the same price. This style appeals strongly to a certain class of drivers. It is unique and attractive and possesses all the most desirable features essential to a satisfaction-giving runabout.

It has a simple single cylinder motor, with 7 h. p. It is lever controlled. Starts from the seat; has safety device to prevent all danger of back fire; effective and easily operated brakes, and many attractive and serviceable features, making it up-to-date and desirable in every way—a big value for the money, and essentially a car for business utility.

Use the Catalog Coupon below for further particulars regarding the Standard Runabout, Model "B," price \$650; the Palace Touring Car, four-cylinder, Model "S," price \$2,250; two-cycle Model "L," price \$1,250, or any of our commercial vehicles.

Our New Models will be on Exhibition at Madison Square Garden Automobile Show, January 13-20, 1906

OLDS MOTOR WORKS, Member A. L. A. M. Lansing, Mich., U. S. A.

CUT COUPON HERE

CATALOGUE COUPON

OLDS MOTOR WORKS
LANSING, MICH.

Kindly send me information regarding cars checked.
I am interested.

Model B.... Delivery Cars....
Model S.... Passenger
15 Model L.... Traffic Cars....

Name _____
Address _____

CUT COUPON HERE

CUT COUPON HERE

CALENDAR COUPON

OLDS MOTOR WORKS
LANSING, MICH.

Enclosed find 10 cents, for which send your Art
Calendar (free from advertising and suitable for fram-
ing) for 1906. Design by George Gibbs. 15

Name _____
Address _____

CUT COUPON HERE

CUT COUPON HERE

MOTOR TALK COUPON

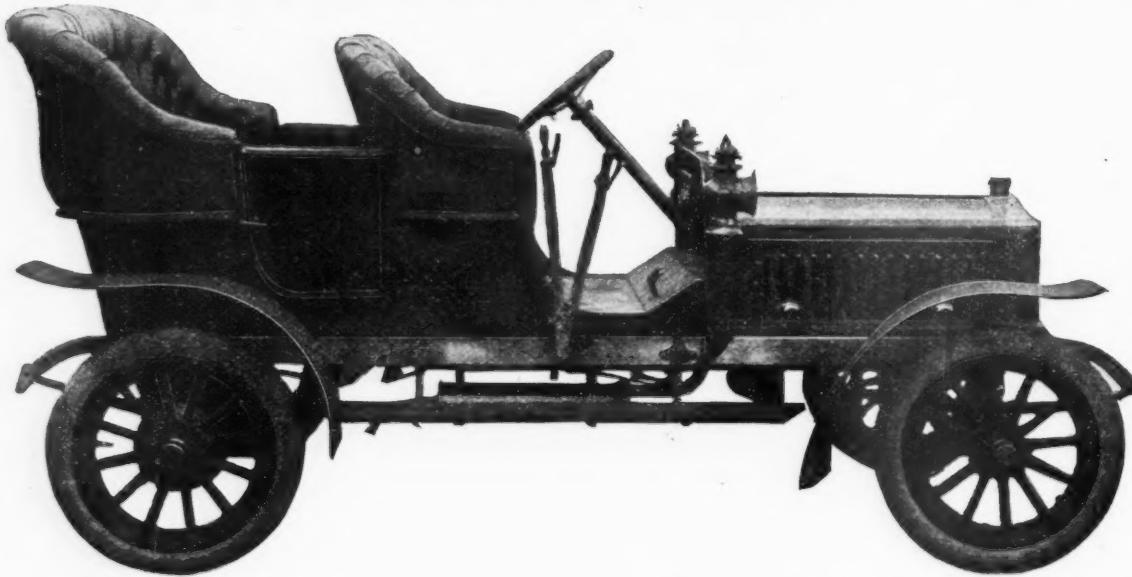
OLDS MOTOR WORKS
LANSING, MICH.

Enclosed find 25 cents, for which have **MOTOR
TALK**, a magazine devoted to automobiling, sent to
me for 1 year. 15

Name _____
Address _____

MITCHELL

"The Car You Ought to Have, at the Price You Ought to Pay"



Model D-4

\$1,800

24-30 H.P.

MOTOR—4 $\frac{1}{4}$ x 5 inches; 4 cylinder vertical.

TRANSMISSION—Slide Gear, 3 forward; 1 reverse, direct drive on high speed with no gears in mesh.

WHEEL BASE—100 inches.

TREAD—56 inches.

WHEELS—32-inch artillery.

TIRES—4-inch.

STEERING GEAR—Irreversible.

CONTROL—Spark and Throttle.

DRIVE—Bevel gear, shaft drive.

LUBRICATION—Mechanical.

CARBURETER—Float Feed.

RADIATOR—Cellular, with fan.

SPRINGS—40-inch, half elliptic.

FINISH—Blue body and gear.

SPEED—40 miles per hour.

Brakes—Foot and hand emergency.

EQUIPMENT—Side lamps and complete set of tools.

¶ A car for the buyer who desires something finer and more luxurious than can be given at the price of our \$1,250 Model B-4.

¶ In this car the engine is larger, the body more roomy, the upholstering of the *best possible quality*, and each detail worked out to the *highest degree of perfection*.

¶ This model will bear the most careful scrutinizing from every point of view and compares favorably with the highest priced cars.

No car at any price can be more perfectly constructed or better finished.

¶ Five models in all comprise 1906 line as follows: — 2-cylinder Runabout, 4-cylinder Runabout, 2-cylinder Touring car, 4-cylinder Touring car (herewith shown), and the famous Mitchell commercial delivery car.

¶ Send ten cents for Art Catalogue — the handsomest ever published.

MITCHELL MOTOR CAR CO. - Racine, Wisconsin

Members American Motor Car Manufacturers' Association

The Stearns

A fulfillment
of Prophecy

One Model 45 Horse Power

Produced by a determination to fulfill now the prophecy of ultimate supremacy for American Automobiles—the result of devoting one factory for ten years to perfecting one model.

We buy material in any country that produces the best for the purpose; but American machinists finish it all—they spend over two thousand hours on each car finishing parts otherwise complete. More time and care than any other touring car receives.

Fitted parts are required when picked up at random to snap together like your watch lid, hang tight, yet part in the hands.

By what process could any maker, anywhere, produce a better car? Where is another so made?

After producing this car we figured the cost and selling price. We were pleased to find that the duties and excessive commissions on our only competitors, make our charge—\$4,250—barely half the cost of any foreign car that makes a comparison possible.

We seek communication with those who will appreciate this car. For such it will give a service greater than any other mechanism the world has produced. Shall we send our book of details?

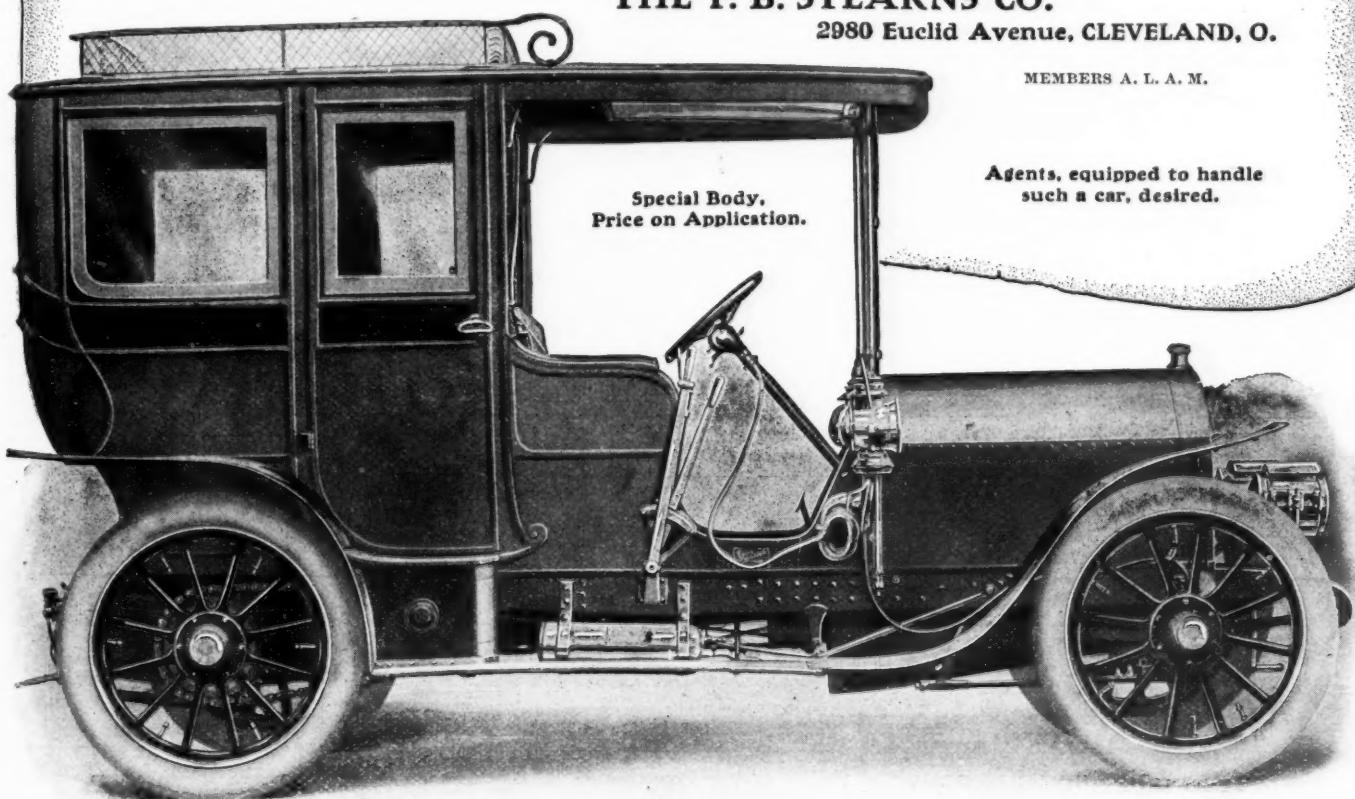
THE F. B. STEARNS CO.

2980 Euclid Avenue, CLEVELAND, O.

MEMBERS A. L. A. M.

Special Body,
Price on Application.

Agents, equipped to handle
such a car, desired.



The Greatest Subscription Offer of the Season

6~~50~~ of the best Automobile Reading Matter for **3~~00~~**

Motor Age of Chicago
and
Motor of New York
For Three Dollars

In addition to above Special Offer we will send absolutely

FREE
ONE COPY OF

A work of practical information for the use of Owners, Operators and Automobile Mechanics,

Giving full and concise information on all questions relating to the construction, care and operation of gasoline and electric automobiles, including

- Road troubles
- Motor troubles
- Carbureter troubles
- Ignition troubles
- Battery troubles
- Clutch troubles
- Starting troubles

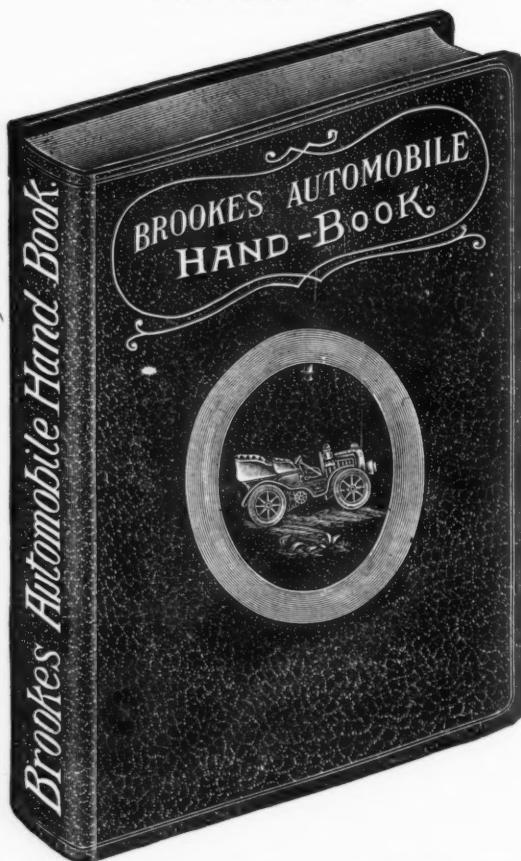
Pocket size, 4x6½. Over 200 pages.

With numerous tables, useful rules and formulas, wiring diagrams and over 100 illustrations, by

L. ELLIOTT BROOKES,

Author of the "Construction of a Gasoline Motor."

Price, One Dollar and Fifty Cents



THIS DOES NOT REFER TO SUBSCRIPTIONS SENT IN PRIOR TO THIS ANNOUNCEMENT

TOTAL VALUE

Motor Age one year	- - -	\$2.00
Motor one year	- - - -	3.00
Brookes Automobile Hand-Book		1.50
		\$6.50

From above you will see, by sending us three dollars, that you receive in return the total value of six dollars and fifty cents.

Don't Delay

but send your order with remittance direct to

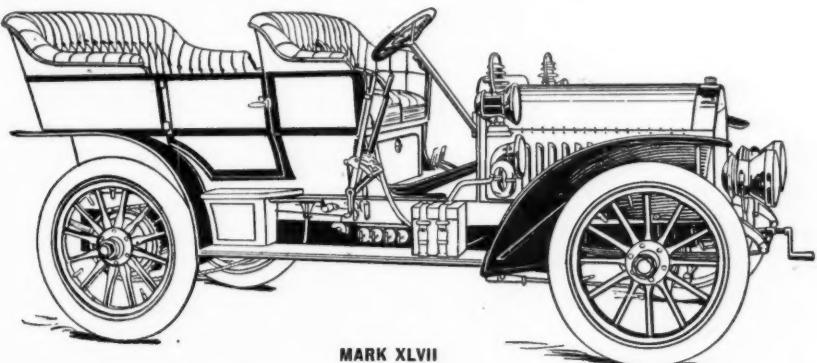
Motor Age

309 Michigan Ave.
Chicago

Columbia

Gasoline Cars for 1906

ARE built of the best materials in the world under methods and processes more advanced than those employed in any automobile factory other than our own. No consideration of the cost of production has been permitted to interfere with making perfect every part and piece of each model, whether pertaining to mechanism, bodywork or general equipment. The expense of making the crankshafts, for instance, is six times greater than that of any previously made in this country. We guarantee that these cars, each according to its power and place, will yield the greatest things possible in motor service.



MARK XLVII

MARK XLVII

40-45 h.p. four-cylinder motor under forward bonnet; sliding gear transmission, four speeds and one reverse; jump-spark ignition from storage battery; new pattern automatic carburetor; special chrome-nickel steel gears, axles, crankshaft and jackshaft; crankshaft machined cold out of solid block; double chain drive; I-beam front axle forged in one piece; pressed steel frame; 108-inch wheel base; seat starting; new pattern brakes. Price, with standard body..... \$4,500
With 112-inch wheel base, Royal Victoria, Double Victoria, Limousine or Landaulet body..... \$5,000 to \$5,500

MARK XLVI

An entirely new model. 24-28 h.p. four-cylinder, vertical water-cooled motor; shaft drive, sliding gear transmission; three speeds and reverse; low tension make and break magneto current ignition; special chrome-nickel steel gears and shafts, crankshaft machined cold out of solid block; I-beam front axle forged in one piece; rotary pump oil lubrication; pressed steel frame, 98-inch wheel base; double side entrance body seating five passengers. Price..... \$3,000

MARK XLIV-2

Perpetuating Mark XLIV, one of the most successful of medium-weight 1905 cars. 18 h.p. double opposed horizontal motor under forward bonnet; frame length increased eight inches, giving ample room forward of each seat; wheel base increased to 90½ inches. Rear seat widened five inches; double side entrance body. An ideal family car, which will climb any hill and maintain a speed of 35 miles an hour on the level. Price..... \$1,750

Columbia Electric Carriages

Victoria-Phaetons, Runabouts, Broughams, Landaulets
Hansom, Surreys, Delivery Wagons, Truck.

Separate catalogues of Columbia Gasoline Cars, Columbia Electric Carriages and Columbia Electric Commercial Vehicles will be sent on request.

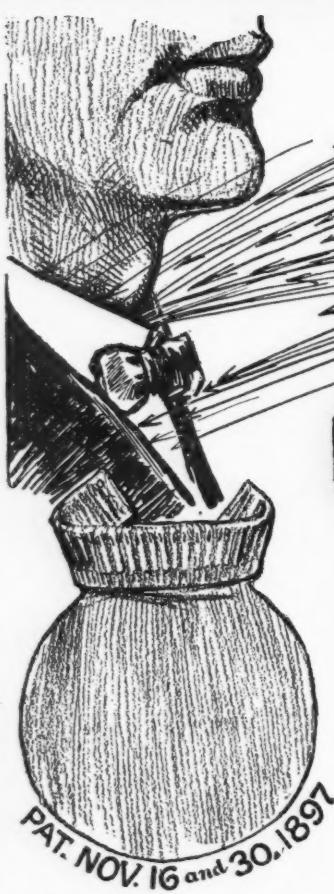
ELECTRIC VEHICLE COMPANY, HARTFORD, CONN.

New York Branch: 134-136-138 West 39th St. Chicago Branch: 1332-1334 Michigan Ave. Boston: Columbia Motor Vehicle Co., 74-76-78 Stanhope St. Philadelphia: Pennsylvania Electric Vehicle Co., 250 North Broad St. Washington: Washington E. V. Transportation Co., 15th St. and Ohio Ave. Paris: A. Blanchi, 194 Boulevard Malesherbes. Member Association of Licensed Auto Mfrs.

WAY'S MUFFLER

PAT. NOV. 16 and 30, 1897

WHICH WAY
DO YOU WANT IT?



An ideal garment for men, women and children.

Most dealers carry Way's Muffler in stock.

If yours don't, write to us direct.

THIS IS THE WAY
YOU WANT IT



Either Protect Your Throat

from draughts, discomfort, cold, illness and pneumonia with Way's Muffler—or stay indoors.

WAY'S Muffler

is a perfect throat and chest protector.

Comes with or without ear tabs as preferred.

Especially adaptable for winter motoring.

As easy to put on as your hat.

The Way Muffler Co.

MANUFACTURERS

Cor. 23d and Arch Streets J. HOWARD WAY, Prop.

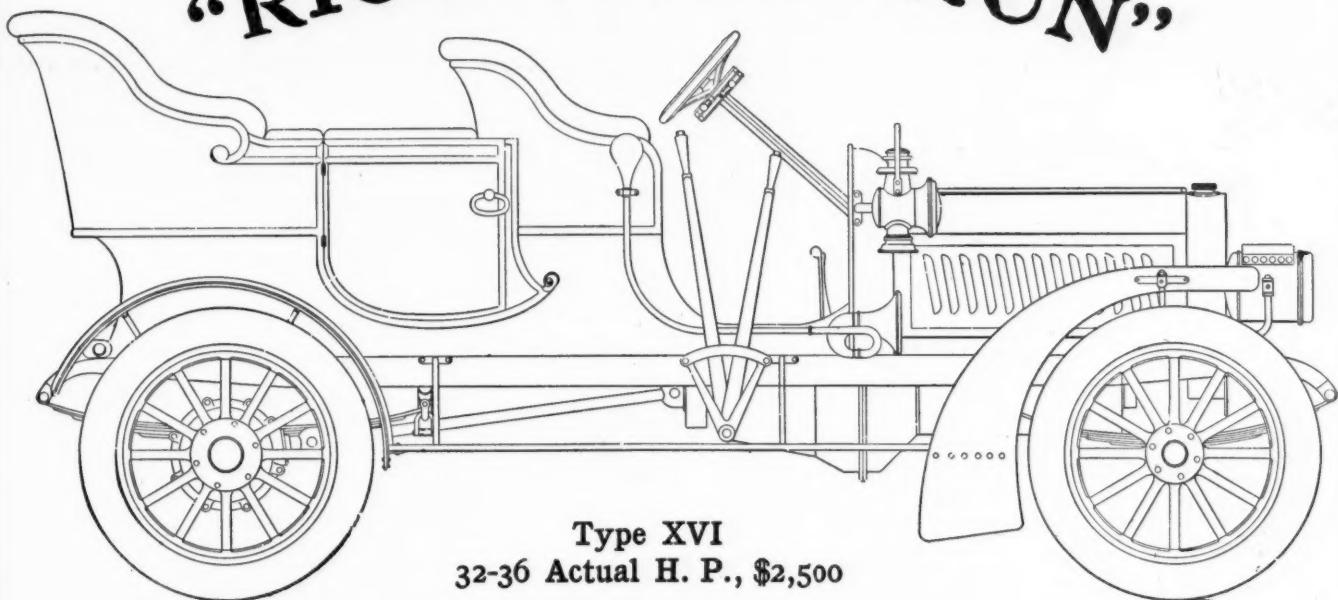
PHILADELPHIA, PA.
Chicago, 920 Medinah Temple
Pittsburg, 9th and Liberty Sts.

New York, 43 Leonard St.
Cincinnati, 21 W. 3rd St.
London, Canada, Hiscox Bldg.

MOTOR AGE

1906 ST. LOUIS 1906

“RIGS THAT RUN”



Type XVI
32-36 Actual H. P., \$2,500

Our 1906 Type XVI is the crowning triumph of fifteen years' experience in building gasoline automobiles. This model represents **EVERYTHING GOOD** in modern automobile construction. You cannot afford to pay more, and you couldn't expect to pay less. Compare Type XVI with any other car listing from \$3,000 to \$5,000, and we doubt if you will find any vast difference in other than the price. An agent should sell a car that will instantly appeal to all classes. Thousands of prospective purchasers are in the market—a few of them will insist on paying \$5,000 and over—a few more will insist on \$2,000 and under, but eight out of every ten will be the **BETWEEN** class, if they can get the satisfaction at a reasonable price. Type XVI is between the two extremes (in price), but from closest observation we fail to see where it will not compare inch for inch with any car built in **AMERICA**. A FAIR, UNPREJUDICED COMPARISON IS ALL WE ASK. It will carry five people comfortably at any speed from four to fifty miles an hour, absolutely noiseless, no vibration, will negotiate 22 per cent grade on high speed. General finish, upholstering and trimmings cannot be surpassed—no matter what the price.

MOTOR—Four-cylinder vertical, under hood, water-cooled, developing 32-36 actual H. P. Entire construction highest grade. Muffler reduces noise to nothing. (Quietest car in existence.)

VALVES—All are mechanically operated, generous bearings (Cramp's special bronze) throughout. Large fan behind radiator.

CRANK CASE—Made of special metal. Instantly accessible aluminum side plates allow instant inspection of connecting rod, crank shaft, etc. Full metal pan under engine.

FRAME—Specially prepared pressed steel, channel section; $4\frac{1}{4}$ inch tapered and reinforced. Motor and transmission integral assuring perfect alignment under all conditions.

TRANSMISSION—Sliding type, three speeds and reverse, all gears made of special high carbon steel. All shifts made with one lever. Clutch metal to metal, multiple disc, load is taken up gradually. No matter how sudden the shift is made the jerk is ABSENT.

Our cars contain many individual features of merit, which we have omitted to mention. Our new elaborate catalogue explains every detail and will be mailed upon request. Fifteen years' building experience has taught us the proper kind of material to use and how to use them correctly. We have simply covered the broad points of general construction, that you may compare Type XVI with other makes costing nearly twice as much. Some cars may COST MORE—but none are better. We have not sacrificed one iota to cheapen our product. The material throughout is **GOOD OLD ST. LOUIS** quality from the ground up. Our name is on it and our guarantee back of it.

LASTLY—We are fast closing all available territory and our agency list will be filled before the New York show. If we are not already represented in your immediate vicinity, you had better write for printed matter AT ONCE. Don't wait until show time and be among the “**ALSO RANS**.” Our agency proposition is most entertaining—it MIGHT pay you to investigate.

CONTROL—New style rack and pinion with ball and socket joints to take up all wear. Spark and throttle control placed conveniently under steering wheel, also accelerator foot pedal to use if desired for **QUICK SPEED CHANGES**.

BRAKE—Three in number—any one of which will hold car on any grade. Same are controlled by both foot and lever at side of car. Application of foot brake throws out clutch, disconnecting transmission from motor.

AXLES—Front extra heavy dropped forged I beam, guaranteed not to spring. Rear axle of the floating type all equipped with Timken roller bearings throughout.

DRIVE—Bevel gear regular ratio three to one. We will furnish lower gearing upon request.

SPRINGS—Large half elliptic of the best quality obtainable. Front 38 inch, rear 48 inch. Three-point suspension throughout, allowing perfect riding over the worst road conditions.

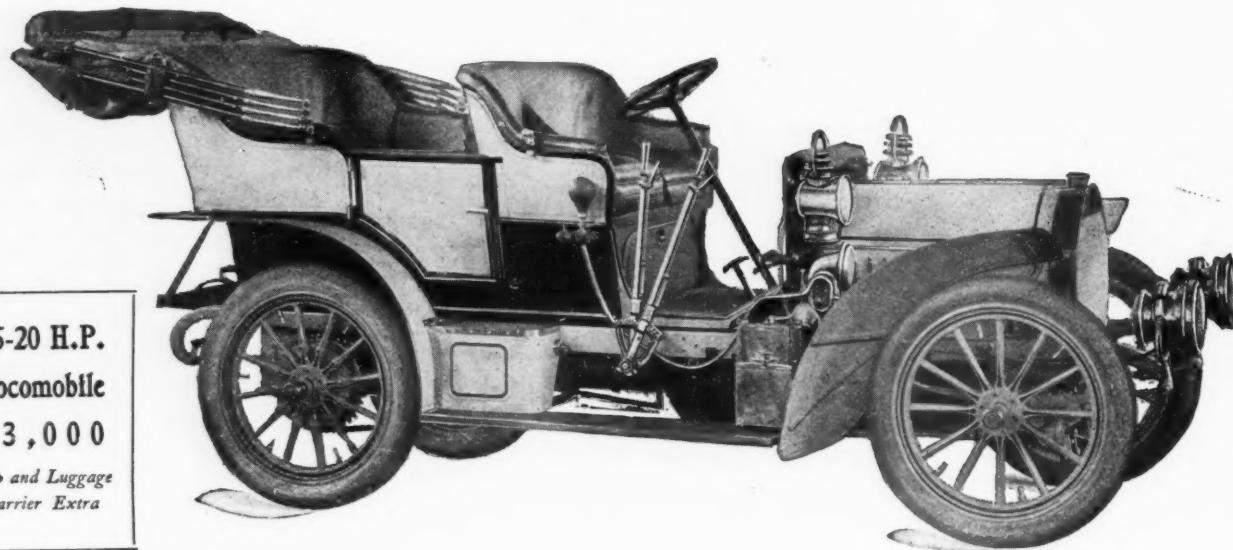
ST. LOUIS MOTOR CAR CO., Peoria, Ill.

General Sales Offices, 1229 Michigan Avenue, Chicago, Ill.

Locomobile

"EASILY THE BEST BUILT CAR IN AMERICA"

15-20 H. P., \$3,000, 30-35 H. P., \$5,000, both with complete touring equipment



15-20 H.P.
Locomobile
\$3,000

*Top and Luggage
Carrier Extra*

TYPE "E"

Locomobile

15-20 H. P.

PRICE—\$3,000 ready for touring.
EQUIPMENT—Five brass lamps, horn, tire carrier, set of tools, extra parts, jack, lock box for tools and lubricants.
BODY—Double side entrance, seating five; extra wide doors; fitted with top irons; color and striping optional.
MOTOR—Four cylinder, $3\frac{3}{4}$ inch bore, $4\frac{1}{2}$ inch stroke.
CAM SHAFTS—Hardened forgings; all cams integral.
CRANK SHAFT—Machined from one solid forging.
LUBRICATOR—Large, mechanical lubricator.
CARBURETOR—Automatic, with balanced throttle valve.
GOVERNOR—Centrifugal type, prompt and positive in action.
IGNITION—Make-and-break.
MAGNETO—Low tension, our own design and manufacture.
ALUMINUM PAN—Placed underneath the machinery.
FRONT FENDERS—Have inner wings extending to bonnet.
CLUTCH—Cone type, with ample surface.
TRANSMISSION—Three forward speeds and reverse.
DRIVE—Double side chains.
DOUBLE UNIVERSAL JOINT—Between clutch and transmission.
RUNNING BRAKE—Large and powerful, metal to metal surfaces.
EMERGENCY BRAKES—Internal expansion type, metal to metal.
BRAKE AND SPROCKET DRUM—Bolted to each rear wheel spoke.
AXLES—"I" section hand welded axles.
RUNNING BOARDS—Rubber covered and brass bound.
TIRES— $3\frac{1}{2} \times 4$ inches on all four wheels.
WHEEL BASE—93 inches.
CONTROL—Gas and spark levers on steering wheel.

TYPE "H"

Locomobile

30-35 H.P.

PRICE—\$5,000 ready for touring.
EQUIPMENT—Five brass lamps, horn, tire carrier, set of tools, extra parts, jack, lock box for tools and lubricants.
BODY—Double side entrance, seating five to seven; extra wide doors; fitted with top irons; color and striping optional.
MOTOR—Four cylinder, $4\frac{1}{4}$ inch bore, $5\frac{1}{2}$ inch stroke.
CAM SHAFTS—Hardened forgings; all cams integral.
CRANK SHAFT—Machined from one solid forging.
LUBRICATOR—Large, mechanical lubricator.
CARBURETOR—Automatic, with balanced throttle valve.
GOVERNOR—Centrifugal type, prompt and positive in action.
IGNITION—Make-and-break.
MAGNETO—Low tension, our own design and manufacture.
ALUMINUM PAN—Is placed underneath the machinery.
FRONT FENDERS—Have inner wings extending to bonnet.
CLUTCH—Cone type, with ample surface.
TRANSMISSION—Three forward speeds and reverse.
DRIVE—Double side chains.
DOUBLE UNIVERSAL JOINT—Between clutch and transmission.
RUNNING BRAKE—Large and powerful, metal to metal surfaces.
EMERGENCY BRAKES—Internal expansion type, metal to metal.
BRAKE AND SPROCKET DRUM—Bolted to each rear wheel spoke.
AXLES—"I" section hand welded axles.
RUNNING BOARDS—Rubber covered and brass bound.
TIRES— $3\frac{1}{4} \times 4\frac{1}{2}$ inches.
WHEEL BASE—106 inches.
CONTROL—Spark and gas levers on steering wheel.

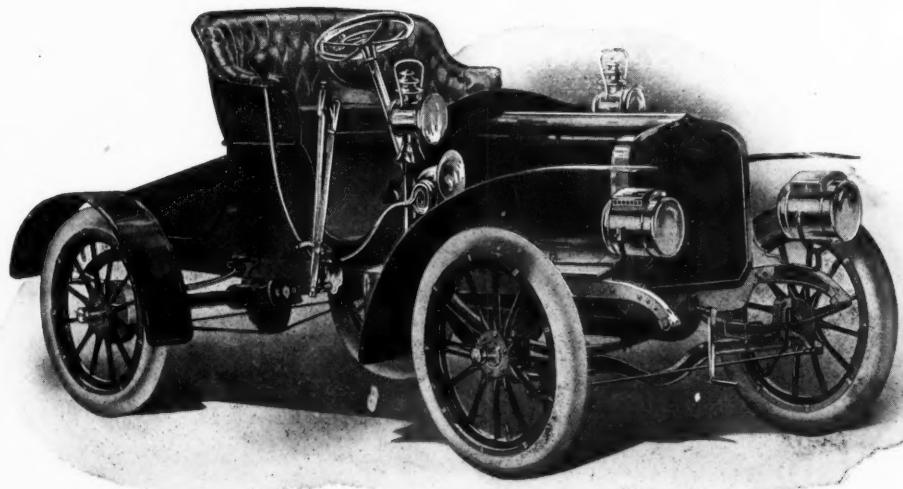
The *Locomobile* Company of America, Bridgeport, Conn.

NEW YORK, 76th St. and Broadway.
PHILADELPHIA, 249 N. Broad St.

Member Association Licensed Automobile
Manufacturers.

BOSTON, 15 Berkeley St.
CHICAGO, 1354 Michigan Ave.

Corbin Cars for 1906



Model G. High Powered Runabout, 24 h. p. \$1,800.

Four cylinder vertical, air cooled engine 24 H. P. mechanically operated valves. Jump spark ignition with synchronized system of distribution of the high tension current. Positive force feed lubrication. Sliding gear transmission, selective system having three speeds forward and reverse. Pressed steel frame and steel pan construction. Bevel gear drive rear axle of the floating type. Front axle I beam section, drop forged in one piece. New type worm and sector steering gear. Internal and external brakes on rear hubs. Body latest French type for two passengers, divided front seats. Long, graceful tail box. Wheel base 93 inches. Weight 1,650 pounds. Speed 50 miles per hour. Three oil lamps, horn and full complement of tools, constitute the equipment.

Annular Ball Bearings Are Employed Throughout

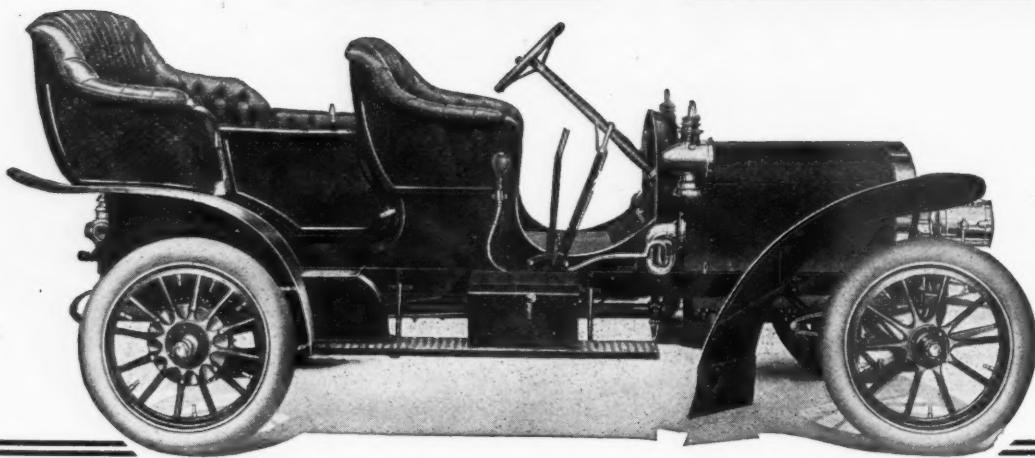
Certain agency opportunities are still open. Representative dealers are requested to communicate with us to insure early delivery of cars.

Corbin Motor Vehicle Corporation

MAKERS OF CORBIN AIR COOLED MOTOR CARS : NEW BRITAIN, CONN.

4 West 38th St., New York. 43 Columbus Ave., Boston. 1406 Michigan Ave., Chicago. 115 East 7th St., Cincinnati
5905 Centre Ave., East End, Pittsburgh 470 Broad St., Newark

THE MARION



In designing the perfect car progress is towards the complex, but improvements are from the complex to the simple. The two questions before us are, first, what is best; and, second, what is simplest. If both can be found in one form that form is certain to be the ultimate. The MARION contains both.

Detailed Specifications of "Model Five"

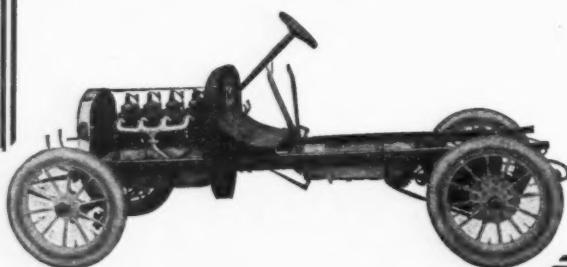
Body:	Beautiful design; wood, selected and thoroughly seasoned; double side entrance, detachable tonneau, door width 21 in.; seating capacity five persons. Semi-divided front seat.
Upholstering:	Finest quality French finished hand buffed leather, curled hair, and oil tempered steel springs in seats and backs. Deep full cushions, luxurious and very comfortable.
Springs: Finish:	Full elliptic, oil tempered; 36 in. front; 38 in. scroll rear; 1 1/4 in. wide. Auxiliary leaves take severe blows. The highest obtainable skill in using paints and varnishes of the finest quality produces a superb finish. Standard color, body light Brewster green, trimmed with black. Running gear light Brewster green. Both having an appropriate fine carmine striping, giving a refined and handsome appearance.
Frame:	Pressed cold rolled steel, consisting of two straight side members and three cross members only. Gusset plates at every joint. Hot riveted.
Hood:	Plain, triple hinged, lifting from either side and removable, brass front grill, stationary.
Weight:	Fully equipped and ready for road 2,100 pounds.
Wheels:	Artillery, Schwartz patent, second growth hickory; 10 spoked front, 12 rear; diameter 32 in. Large ball bearings.
Wheel Base:	108 inches.
Wheel Gauge:	56 1/2 in. from center to center of tread.
Tires:	4 in. Clincher type, of any standard American make. Optional 3 1/2 in. Fisk heavy car type.
Control:	Right hand side. Steering wheel 16 in., gear irreversible. Spark and throttle levers in wheel. Clutch and running brake operated by "push" pedals. Gear shifting and emergency brake levers at side.
Brakes:	Hand and foot, very powerful, in the form of bronze expanding shoes applying within drums fastened to spokes of wheels.
Motor:	4-cylinder vertical, placed lengthwise. "Marion" system of air-cooling. Mechanically operated valves; cam shaft and gear inclosed within crank case, of aluminum. All working parts carried by upper half of case; lower half removable without interfering with bearings. Starting crank fastened to frame and held in vertical position when not in use.
Horse-power:	24-28. Range of speed 150 to 1,500 revolutions per minute.
Cylinders:	Special quality cast iron, machined all over, giving absolute uniform distribution of metal. An important air-cooled feature. 4 1/2 in. bore; 4 1/2 in. stroke.
Crank Shaft:	4 throw; 1 1/4 in. diameter; machined from hand forged billets of 25 point carbon steel. Five extra long bearings, the rear being 4 1/4 in.
Fly Wheel:	Accurately turned, balanced, and finished, 19 in. in diameter; weight 105 pounds. 6 fan blade spokes.
Fan:	Aluminum, 16 in. in diameter, Hess-Bright bearings. Driven by 1 1/4 in. flat belt.
Lubrication:	Splash, 4 compartments in bottom half crank case, holding approximately one gallon of oil, sufficient for 200 miles. Supply readily replenished by tank supported from crank case. Inspection glasses to ascertain height of oil.
Muffler:	Exceptionally large, noiseless, and without back pressure. Exhaust pipe 2 1/2 in. in diameter. Cutout operated by heel.
Ignition:	Jump spark, 4 unit coil, 3 cell 6 volt storage battery, good for 1,000 miles, carried in box in running board. Plugs located in intake chamber; fouling impossible.
Gasoline Capacity:	17 gallons. Copper tank under front seat.
Clutch:	In transmission case; multiple disc; non-adjustable and running in oil. Gradual but positive engagement.
Transmission:	Sliding gear, 6 pitch, giving 3 forward speeds and reverse. Secondary shaft does not revolve when driving on top gear.
Drive:	Double side chain; large sprockets; 25 and 40 teeth.
Road Clearance:	10 in. This extreme is only possible by the divided chain drive.
Dash:	Cast aluminum, oval.
Equipment:	2 acetylene head lights, 1 acetylene gas generator, 2 oil side lamps, 1 oil tall lamp, 1 French horn, reflexible tube; a complete set of tools and parts carried in accessible tool box under rear of frame.
Accessibility:	THROUGHOUT.

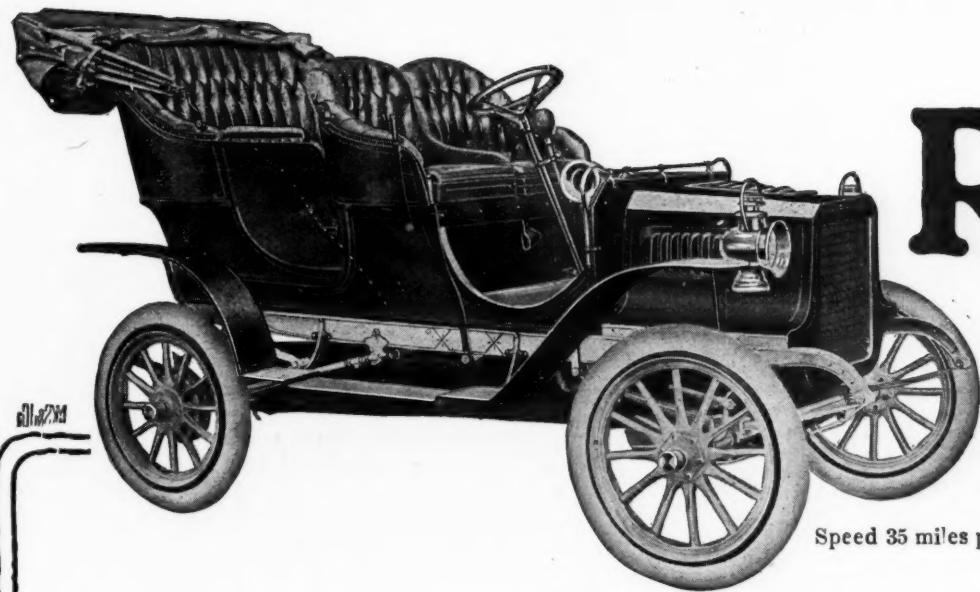
FOUR CYLINDER \$2500
 AIR COOLED \$1500
\$1250
 Model Five...28 H. P. Touring Car.....
 Model Two...16 H. P. Touring Car.....
 Model Four...16 H. P. Physician's Runabout..

Look up at the New York and Chicago Shows.

MARION MOTOR COMPANY INDIANAPOLIS INDIANA

We have a few attractive agency propositions still open.





REO

REO 1906 TOURING CAR
—16 h. p., 1600 pounds, 90-inch
wheel base, 5 passengers, side
door detachable tonneau.

Speed 35 miles per hour, \$1,250.

The REO Bus with exactly the same motor won the National Trophy in the great 6-day Economy Test by carrying its load 682 miles at a total cost of one cent per mile per passenger.

The REO Face

No worry; no mind-strain; no anxiety goes with a REO car.

The few simple operating devices are placed exactly ready to the hands and feet. Every movement is as natural as walking.

The feeling of surplus power under absolute command; the sense of strength, certainty and comfort; the assurance of getting there and back—these make the satisfied expression of the REO face.



Better get it

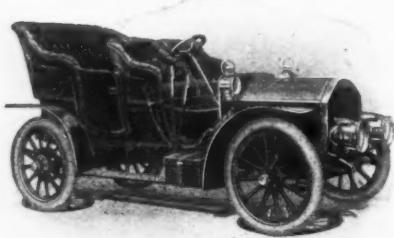
REO 1906 RUNABOUT—8 h. p., 900 pounds, 2 passengers, 25 miles per hour, \$650. With folding seat to carry two extra passengers facing forward, \$675.

REO Motor Car Co.

Sales Department, Lansing, Michigan
R. E. Olds, President R. M. Owen, Sales Mgr.

Agencies throughout the United States

Waltham-Orient



Waltham-Orient Model R, \$2,250.
The Keystone of the Air-cooled Arch.

The Car of To-day Must do More than Look its Price. The high priced, high powered motor car is all right—it has its place and its purchasers, but the **popular demand** is for a car of moderate price, reasonable speed that will be maintained up-hill as well as on the level road; that will arrive on time and return when expected; that will keep on the road and out of the repair shop; that can be operated economically and safely and does not require the employment of a professional chauffeur; that will remain in service winter as well as summer.

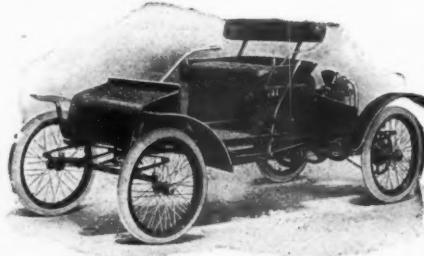
It must look well—ride well—run well—and keep well. That's where your pleasure comes in. You pay your good money for it and you have a right to expect it.

It is because it combines all of these important and necessary features that

The Waltham-Orient is the Leading American Car of its Price

Five Touring Models for 1906

Model R, a Swell Special 20 h. p.	-\$2,250
Model N, 20 h. p. Tourist	-\$2,000
Model L, 16 h. p. Tourist	-\$1,750
Model M, 16 h. p. Runabout, Detachable Tonneau,	-\$1,750
Model K, 16 h. p. Two-passenger Runabout,	-\$1,600



Friction-drive Buckboard Model BB, \$400.
The lowest priced Motor Car made in the World.

A Greyhound can run a mile as rapidly as a five thousand dollar Racehorse, and he can course through the sand and up the cliffs where the thoroughbred cannot follow; which only goes to prove that price, bulk, weight and power rating do not necessarily mean the first to finish nor the one to get nearest the top of the mountain.

The Buckboard is the Greyhound of Motor Cars. It makes no pretensions to being the thoroughbred horse. It has no five thousand dollar price tag on it, but is simply in a class of its own, equally a pleasure to its owner, for it serves its purpose and serves it well.

WHY?

BECAUSE: It creates interest quicker than any car you can represent. It conflicts with no other sales. It makes Motorists out of Horsemen and Cyclists. It sells to owners of the "thoroughbreds" for daily service to the station, the country club or the seashore. It sells for Rural Mail Routes, Telephone and Telegraph Linesmen, Parcel Delivery, etc. It requires less time and trouble for each sale, and less subsequent expense and repairs. It has an operating cost less than one-third of any other motor car in the world. It will run 35 miles to the gallon of gasoline, and 100 miles to the pint of oil. It has a maximum power ratio of 40 to 1. No other car exceeds 18 to 1. It will climb 40 per cent official grade and run 30 miles or more per hour. If you will write us we will send you forty other reasons.

We are alive for live agents. Write for specifications and agency proposition.

We will exhibit only at the New York, Chicago and Boston Shows.

DISTRIBUTING DEPOTS

NEW YORK—Waltham Mfg. Co., 1615 Broadway.
BOSTON—Waltham-Orient Motor Car Co., Auto Arcade.
PHILADELPHIA—Martin & Hart Motor Co., 215 N. Broad St.
PROVIDENCE—The Shepard Company.

CHICAGO—The Waltham Motor Car Co., 433 Wabash Ave.
LOS ANGELES—Diamond Motor Car Co., 2604 S. Main St.
BALTIMORE—Auto Supply & Storage Co., 1416 Madison Ave.
CINCINNATI—Queen City Auto Co., 538 West McMicken Ave.

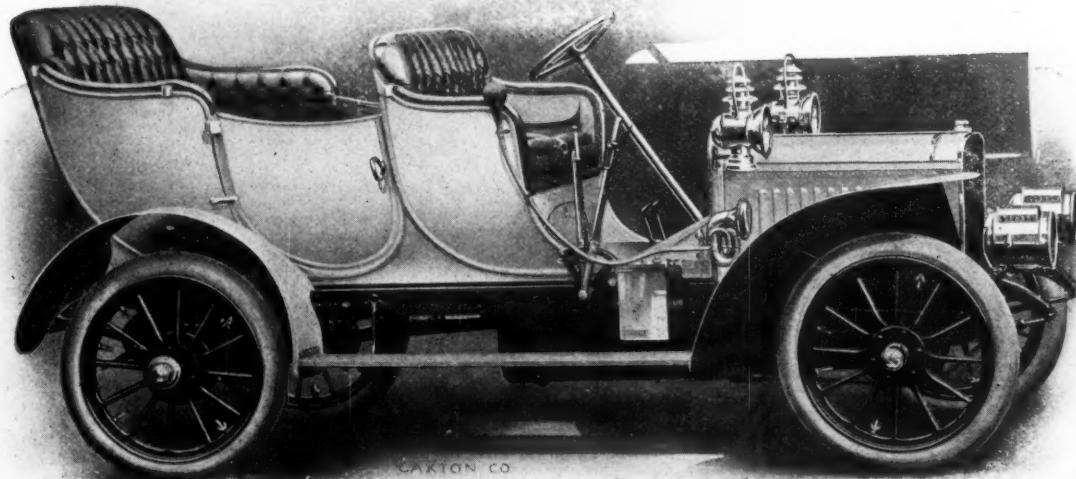
WALTHAM MANUFACTURING COMPANY

GENERAL OFFICES AND FACTORY
WALTHAM, MASSACHUSETTS, U. S. A.
Members of Ass'n Licensed Auto. Mfrs.

ANNOUNCEMENT

The
1906
Model F30-35
H. P.

Cleveland



CAXTON CO

Is now ready for immediate delivery. A demonstrating car is in commission at the salesroom of our General Eastern Distributing Agent, E. B. Gallaher, 228-230 W. 58th St., New York, also at our Cleveland salesroom.

BRING AN EXPERT WITH YOU

NO other American car is made of such uniformly perfect and high-grade material adapted to the purpose, or so thoroughly and intelligently assembled. There is no car on the American market that will stand up to its work so well or so long. Infinite care is exercised in every detail of construction and the **Cleveland** car represents the highest and most advanced ideas in automobile building. It is in a class by itself. The complete chassis of the **Cleveland** car is manufactured by the Garford Company, whose experts have designed and built more high-grade automobile parts and complete chassis than any other concern in America, and the **Cleveland** is, therefore, the product of years of practical experience.

SPECIFICATIONS

ENGINE—30-35 H. P., 4-cylinder, water-cooled.	TIRES—34x4.
IGNITION—Simms-Bosch low tension Magneto—make and break ignition.	VALVES—Mechanically operated, inlet and exhaust interchangeable.
TRANSMISSION—Sliding train, 3 speeds forward and one reverse.	CARBURETOR—Float feed, requiring no adjustment.
REAR AXLE—Shaft drive, clutch driven hub. Ball bearings.	BRAKES—Two internal expansion, dust protected, operating on rear hubs through emergency lever, holding either forward or backward. Foot brake operates on propeller shaft. Both brakes bronze against steel.
FRONT AXLE—I-Beam section. Ball bearings.	BODY—Victoria or double phaeton, tulip side entrance.
FRAME—Cold rolled pressed steel, aluminum under bonnet covering entire engine and transmission.	EQUIPMENT—Two head lights, 1 generator, 2 side lights, 1 rear light, 1 horn, and tools.
WHEEL BASE—104 inches.	
WHEELS—Imperial whalebone, grade A, second growth hickory.	

Price \$3,500 to \$5,000, Depending Upon Body Equipment. The 20 H. P. Model D will be continued without change. Price \$2,800. Both models guaranteed for one year.

CATALOGUE AND FULL INFORMATION UPON REQUEST.

Cleveland Motor Car Co. Cleveland, Ohio

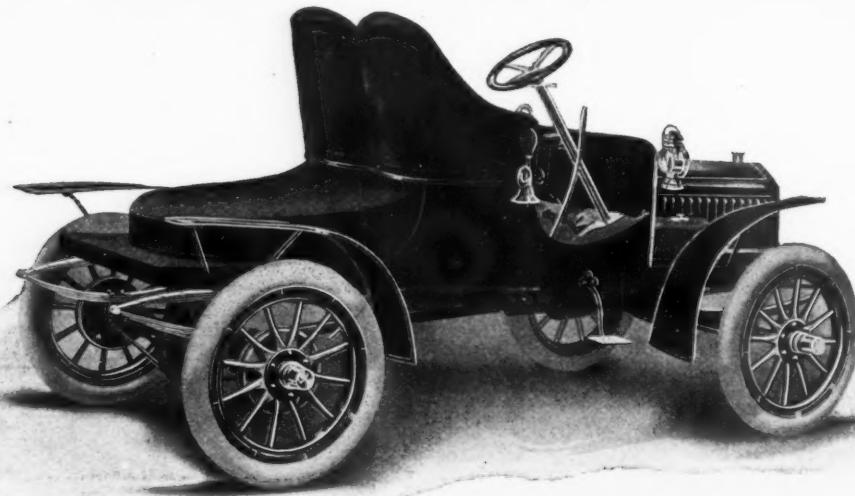
New York, E. B. Gallaher, 228-230 W. 58th St., New York
Gen'l Eastern Distributing Agent

DEPT. 5
Boston Agent, Butler Motor Car Co., 998 Boylston St., Boston
California Agent, A. P. Worthington, Los Angeles, California

Owing to the unusual interest in the **Cleveland Car**, agents in unassigned territory are advised to enter into early negotiations.

Wayne

One of Our 1906 Models



Wayne Model H \$800 Two Passenger Runabout

Motor, 2-cylinder opposed under hood. Cylinders, $4\frac{1}{2} \times 4$ developing 14 H. P., water-cooled. Transmission, planetary gears with DIRECT BEVEL GEAR DRIVE. Control is by a single lever which engages the high speed clutch and reverse. The brake and slow speed are controlled by foot pedals. Wheels, 28x3. Equipment, complete set of tools.

The strong features of this car are the extreme simplicity of the engine and transmission. The crank case and transmission case form one casting and the entire engine can be taken apart or assembled in half an hour.

Model F 4-cylinder car, cylinder $5\frac{1}{2} \times 5$. 50 H. P. Seating 7 people. Price, \$3500.

Model K 4-cylinder, five-passenger touring car. 35 H. P. Sliding gear transmission. Price, \$2500.

Model B 4-cylinder, five-passenger car. 24-28 H. P. Sliding gear transmission. Price, \$2000.

Model C Five-passenger car. Double opposed motor. 20 H. P. Planetary transmission. Price, \$1250.

The Wayne Agent can supply a high-grade car at any price his customer may demand.

We have the BEST—Car for the Customer
—Proposition for the Agent

Write for Agency arrangements and descriptive matter, if you can't wait till the Shows
New York and Chicago Shows, of course, 69th Regiment Armory, New York

WAYNE AUTOMOBILE COMPANY

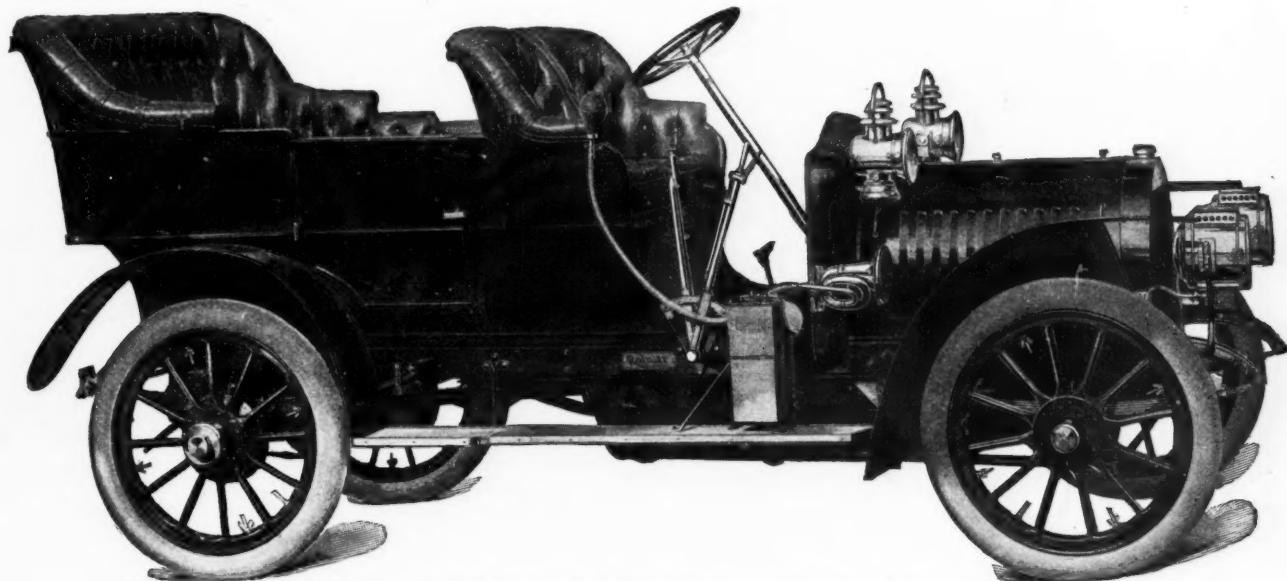
DETROIT, MICHIGAN

THE 1906 MODEL B

Rainier

“THE PULLMAN OF AUTOMOBILES”

Absolutely the highest grade motor car built in this country, bar none, and the only car that can consistently compete with foreign machines. You will do yourself an injustice if you decide on your car without investigating this triumphant American production. New style make and break spark. Simms-Bosch Magneto, bevel gear drive. Very large and roomy, full aluminum bodies.



MODEL B RAINIER, 30-35 H. P. PRICE, \$4,000.

Guaranteed free of repairs for one year

Do you realize fully the great superiority of the “make and break” over the jump spark? Do you know that it does away entirely with the coil, the commutator, the batteries, and the spark plugs, and substitutes for all these a simple hammer and anvil, mechanically operated, which cannot get out of order?

Do you know that 90 per cent. of the foreign makers have already adopted this method? Do you know that the RAINIER car is guaranteed not to cost one dollar for repairs within one year of purchase, unless you have an accident, and that it stands alone in this respect?

Learn all about it in our new Bulletin just issued.

THE RAINIER COMPANY, Broadway, Cor. 50th Street, New York

BOSTON AGENTS: MORRISON-TYLER MOTOR COMPANY

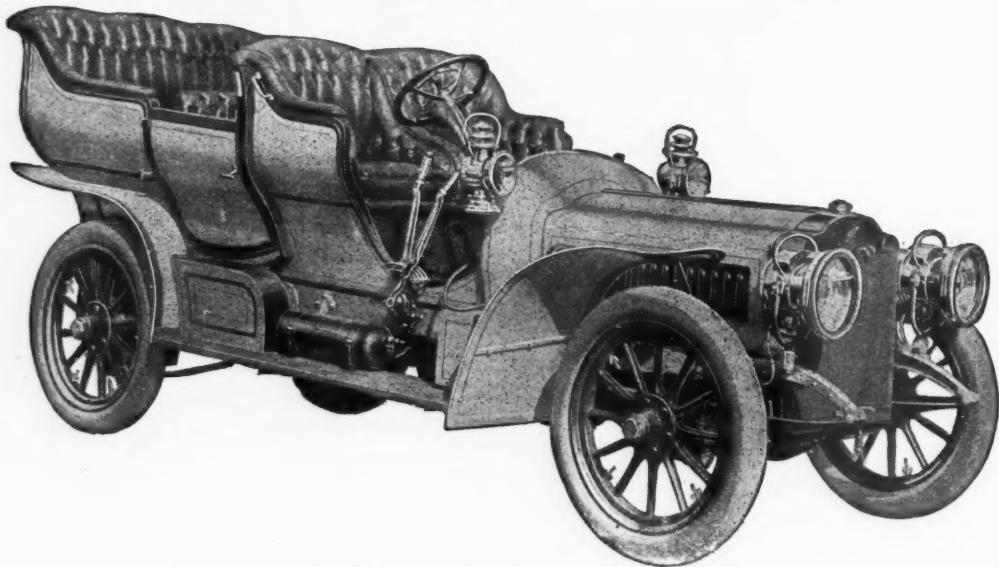
Good Agents Wanted in Unassigned Territory.

We shall exhibit at the Armory Show in New York.

NO—Sixty Miles an Hour is Not Necessary

BUT IT'S SATISFACTION TO KNOW THAT YOU CAN
ATTAIN THAT SPEED IF YOU WISH IN THE 50 H. P.

THOMAS



Why do we emphasize the fact that every stock Thomas is guaranteed to show sixty miles an hour before leaving the factory? Not because that is its chief claim upon your consideration. Not because the average owner cares to travel at any such speed. But because the extraordinary efficiency of the Thomas in that respect is merely an indication of its absolute perfection in every other respect.

We believe 50 h. p. to be necessary to the highest degree of smoothness, easy riding and comfort in taking steep grades or rough roads, and picking up speed quickly without changing gear on crowded streets. That's what the Thomas furnishes—full 50 horsepower.

The Thomas does not merely court comparison with the best American Cars—it invites competition for all-around efficiency under any and all conditions with the best cars made anywhere in the world.

The sixty-miles-an-hour guarantee, as we have said is merely incidental to its perfection in every other point.

We would suggest that your investigation be made as early as possible. Even the increased capacity of this great factory will not entirely meet this year's phenomenal demands.

THE E. R. THOMAS MOTOR CO. ¹⁴¹⁷ Niagara St. Buffalo, N. Y.

Members Association Licensed Automobile Manufacturers.

HONORABLE MENTION

SCHEBLER CARBURETORS

STANDARD OF

THE WORLD

NATIONAL
MOTOR
VEHICLE CO.

CABLE ADDRESS
"AUTOMOBILE"
INDIANAPOLIS.

W.U. CODE,
A.B.C. CODE
4TH EDITION

Mr. F. H. Wheeler,
CITY,

Indianapolis, Ind. Nov. 30, 1905.

Dear Sir:--

The National motor car was equipped with one of your Schebler carburetors during its World's Record travels at the Indianapolis Fair Grounds Track November 16 and 17. During the entire 24 hours continuous running the carburetor never once faltered, but gave a perfect mixture at all engine speeds regardless of day or night temperature. We cannot find words of sufficient praise with which to express our appreciation of its magnificent performance.

Yours very truly,
NATIONAL MOTOR VEHICLE CO.,

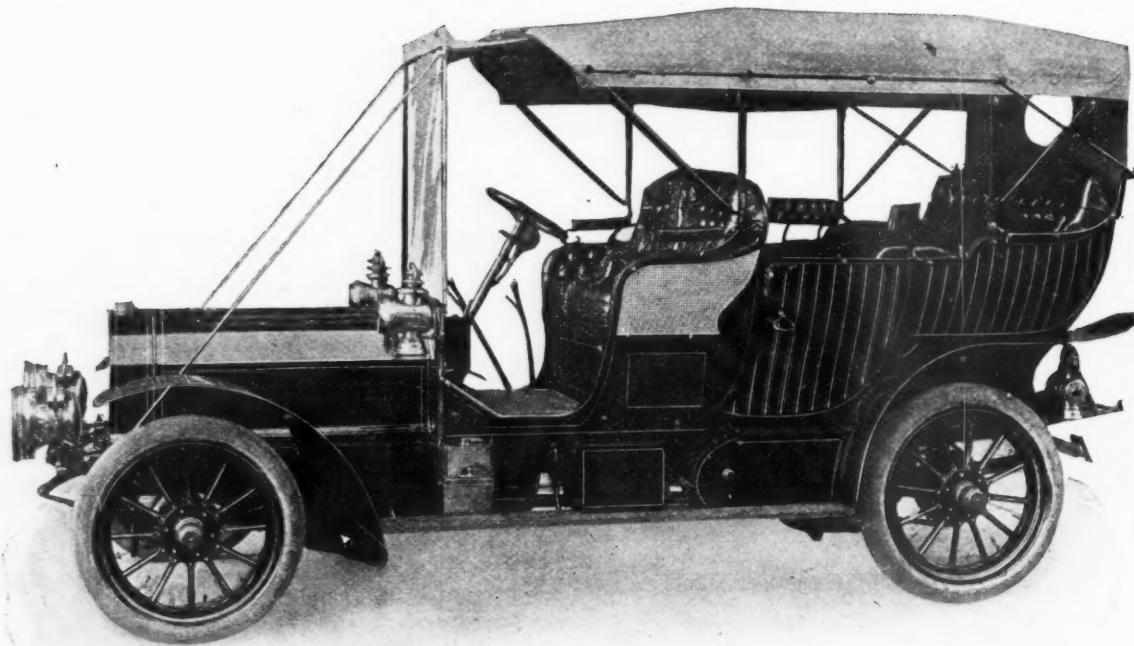
Geo. T. McArthur

WHEELER & SCHEBLER, Mfrs., Indianapolis, Ind., U. S. A.

P. J. DASEY, Factory Representative, 481 Wabash Avenue, Chicago, Illinois
 E. J. Edmond.....44th St. and 6th Ave., New York City
 Excelsior Supply Co.....Chicago
 Automobile Supply Co.....Chicago
 Beckley-Ralston Co.....Chicago
 E. B. Belcher.....26 Green St., Malden, Mass.
 Jos. Brassard.....Central Falls, R. I.
 Ellsworth Foundry & Machine Shop.....Ellsworth, Me.
 National Electric Supply Co.....Washington, D. C.
 Smith Electrical Engineering Co.....Watertown, N. Y.
 The Wallace Bros. Co.....Norfolk, Va.
 N. Philadelphia Auto Station.....3425 N. Broad St., Philadelphia

Agencies in all the Principal Cities of the World
 F. C. Bowlus.....332 Baronne St., New Orleans
 Consolidated Supply Co.....Denver
 Chanslor & Lyon Motor Sup. Co. 503 Golden Gate Av., San Francisco
 Los Angeles Auto Co.....Los Angeles
 McCulloch & Boswell.....Winnipeg, Man.
 Wilson & Co.....Ottawa, Ontario, Can.
 Canada Cycle & Motor Co.....Toronto Junction, Can.
 Schuman Carriage Co.....Honolulu, T. H.
 Turnbull & Jones.....Dunedin, N. Z.
 Geo. Neill & Co.....38 Fenchurch St., London, England
 Du Brie Motor Co.....Detroit, Mich.

APPERSON



50-55 H. P. Car With Special Body. Price on Application.

Apperson Bros. Build Special Cars

For those who want the best. We only build fine, high-priced cars and each car is given personal attention not given in factories where cars are turned out by the hundred. We make practically every part of our cars in our own factory. No hand-me-down material made by parts makers will be found in our product.

BRANCH HOUSES:

BOSTON: 43 Columbus Ave.

NEW YORK: 66 West 43d St.

PHILADELPHIA: 326 N. Broad St.

CHICAGO: 394 Wabash Ave.

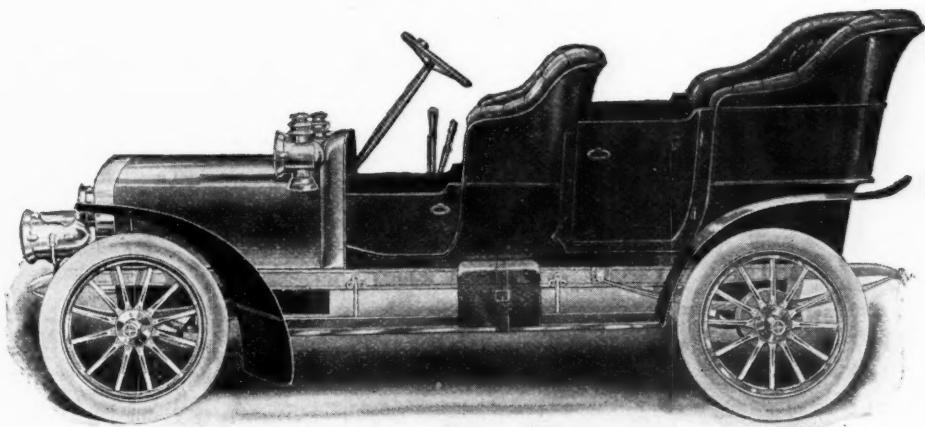
Apperson Bros. Automobile Co.

Members Association Licensed Automobile Manufacturers.

KOKOMO, INDIANA

Aerocar

*The Car of to-day, to-morrow and the years to come,
—Built by practical men.—*



Here is the **one** motor car driven by a reliable, test-proven air-cooled motor.

The vital factor in every motor car is the motor.

All Automobile authorities—people who have had most experience—concede that many improvements are necessary in water cooled motors—too many mechanical complications, too much weight, too many troubles.

The same authorities agree that in the reliable, success-proven air-cooled motor lies the solution of most all motor car troubles.

The **Aerocar** has such an air-cooled motor. It has taken eight years of continual efforts, experimenting, testing, proving and many thousands of dollars to produce this reliable air-cooled motor, but the results sought have been secured, and they are well worth all the time, labor, and money expended.

The air-cooled motor of the **Aerocar** is of wonderful efficiency in power. Runs with the uniform smoothness and rhythm of an electric dynamo—under all climatic conditions, over all sorts of roads. Has strength of construction with simplicity of control, giving great durability of service, develops continuous higher power for weight, and gives greater speed than any other motor.

In the necessary, the vital qualities for satisfactory service, the air-cooled motor of the **Aerocar** is supreme—in a class by itself—the motor that "motes" when you want it to serve you.

The body of the **Aerocar** compares most favorably with any car either foreign or American. It embodies the best features of each, is graceful in line, is luxuriously roomy and comfortable; is finished and upholstered strictly up-to-date.

Aerocar 1906. 24 h. p. Four cylinders. Five passengers. 45 miles an hour. 104-inch wheel base. Shaft drive. Sliding gear transmission. Three speeds forward and reverse. Leather-faced cone clutch. Hollow steel dash. Four sight lubricator on dash. Tool box on running board. 34x4 tires. 9-inch road clearance. Weight 2,000 pounds. Fully equipped, ready for the road, including two large gas headlights, \$2,800 f. o. b. Detroit.

Will be exhibited and demonstrated at the Automobile Shows in New York and Chicago.

The dealer who has the selling agency of the **Aerocar** will have a gold mine. Territory being rapidly taken up. If interested write us promptly.



The AEROCAR COMPANY, Detroit, Mich.

The NATIONAL SHOW

Feb. 3-10, 1906

WILL BE HELD AT

CHICAGO

Completely filling 100,-
000 square feet of
space afforded by the

COLISEUM AND FIRST REGT. ARMORY

LIST OF EXHIBITORS

AUTOMOBILES

Aerocar Company.
American Motor Car Co.
Adams Co. (The).
Acme Motor Car Co.
Auto. Importing Co.
American Locomotive Motor Car Co.
American Motor Truck Co.
Archer & Co.
Auburn Automobile Co.
Austin Automobile Co.
Apperson Bros. Auto. Co.
Autocar Co.
Baker Motor Vehicle Co.
Bartholomew Co. (The).
Berkshire Automobile Co.
Blomstrom Motor Co., C. H.
Buffalo Electric Carriage Co.
Buckeye Mfg. Co.
Buick Motor Co.
Cadillac Auto. Co.
Corbin Motor Vehicle Co.
Chicago Automobile Mfg. Co.
Chicago Pneumatic Tool Co.

Cleveland Motor Car Co.
Columbus Buggy Co.
Duryea Power Co.
Doisom & Sons, John L.
Daimler Mfg. Co.
Dayton Motor Car Co.
Dorris Motor Car Co.
Electric Vehicle Co.
Elmore Mfg. Co.
English Daimler Co.
Franklin Mfg. Co., H. H.
Ford Motor Co.
Harrison Wagon Co.
Haynes Automobile Co.
Holzman Automobile Co. (The).
Jeffery & Co., Thomas B.
Jackson Automobile Co.
Knox Automobile Co.
Knight & Kilbourne.
Kansas City Motor Car Co.
Locomobile Co. of America.
Logan Construction Co.
Lozier Motor Co.
Lear, Oscar, Automobile Co.

Mitchell Motor Car Co.
Moon Motor Car Co.
Marion Motor Car Co.
Maxwell-Briscoe Motor Co.
Moline Automobile Co.
McCREA Motor Truck Co.
Motorcar Company.
Michaels Co., H. Sargent.
National Motor Vehicle Co.
Northern Mfg. Co.
Nordyke & Marmorn Co.
Olds Motor Works.
Palais de l'Automobile.
Panhard & Levassor.
Packard Motor Car Co.
Peerless Motor Car Co.
Pierce Co., George N.
Pope Mfg. Co.
Premier Motor Mfg. Co.
Pierce Engine Co.
Pungs-Finch Auto. & Gasoline Engine Co.
Reliance Motor Car Co.
Royal Motor Car Co.

Reo Motor Car Co.
Rapid Motor Vehicle Co.
Rainier Co. (The).
Stearns Co., F. B.
Stevens Arms & Tool Co., J.
St. Louis Motor Car Co.
Studebaker Automobile Co.
Synnestvedt Machine Co.
Smith & Mabley, Inc.
Soules Motor Car Co.
Temple, Ralph.
Thomas Motor Co., E. R.
Tincher Motor Car Co.
Vehicle Equipment Co.
Waltham Mfg. Co.
Wayne Automobile Co.
White Sewing Machine Co.
Woods Motor Vehicle Co.
Winton Motor Carriage Co.
Windsor Automobile Co.
Welch Motor Vehicle Co.
Werner, Oscar.
Western Tool Works.

ACCESSORIES

American Electric Novelty & Mfg. Co.
American Lamp Co.
Arnstein, Eugen.
Atwood Mfg. Co.
Aurora Automatic Machine Co.
Automobile Supply Co.
Autocoll Co.
Auto Accessories Mfg. Co.
Automobile, The.
Badger Brass Mfg. Co.
Baldwin Chain & Mfg. Co.
Beckley-Ralston Co.
Belden Auto. Transmission Co.
Brown-Lipe Gear Co.
Brennan Mfg. Co.
Brown, Wm. H.
Bowser & Co., S. F.
Briscoe Mfg. Co.
Byrne Kingston & Co.
Chicago Battery Co.
Chicago Caloric Engine Co.
Cook Rly. Track Appliance Co.
Continental Caoutchouc Co.
Cullman Wheel Co.
Consolidated Mfg. Co.
Culver Novelty Co.
Cycle & Auto. Trade Journal.
Dac Automobile Supply House.
Dayton Folding Tonneau Co.
Detroit Motor Car Supply Co.
Detroit Steel Products Co.
Diamond Rubber Co.

Dixon Crucible Co., Joseph.
Diamond Chain & Mfg. Co.
Dietz Co., R. E.
Dayton Electrical Mfg. Co. (The).
Duff Mfg. Co.
Duplex Coll. Co.
Edmunds & Jones Mfg. Co.
Excelsior Supply Co.
Firestone Tire & Rubber Co.
Fisk Rubber Co. (The).
Gabriel Horn Mfg. Co.
Gaulois Tire Co.
Gearless Transmission Co.
Goodrich Co., B. F. (The).
Goodyear Tire & Rubber Co. (The).
Gray & Davis.
G. & J. Tire Co.
Hancock Mfg. Co.
Hartford Suspension Co.
Harris Oil Co., A. W.
Hardy Co. (The).
Hartford Rubber Works Co. (The).
Hendee Mfg. Co.
Hicks Speed Indicator Co.
Hine-Watt Mfg. Co.
Horseless Age.
Hutchinson Electric Horn Co.
Hyatt Roller Bearing Co.
Imperial Brass Mfg. Co.
International A. & V. Tire Co.

Jones Speedometer.
Kinsey Mfg. Co.
Knoblock-Heideman Mfg. Co.
Limousine & Carriage Mfg. Co.
London Automobile Supply Co.
Long Mfg. Co.
Look Electric Co.
Manhattan Storage Co.
Madison-Kipp Mfg. Co.
McGahan Mfg. Co.
McCord & Co.
McKeague, J. B.
Milwaukee Rubber Works Co.
Michelin Tire American Agency.
Morgan & Wright.
Motor Age.
Motor Car Equipment Co.
Motsinger Device Mfg. Co.
N. Y. & N. J. Lubricants Co.
National Carbon Co.
North Chicago Machine Co.
Oliver Mfg. Co.
Pennsylvania Rubber Co. (The).
Pantasote Co. (The).
Prest-O-Lite Co. (The).
Prosser, Thomas, & Sons.
Reilly, P., & Son.
Remy Elec. Co.
Republic Rubber Co.
Rose Mfg. Co.
Railway Appliances Co.
Sherwin-Williams Co.
Samson Leather Tire Co.

Standard Carriage Lamp Co.
Spicer Universal Joint Mfg. Co.
Swinehart Clincher Tire & Rubber Co.
Standard Oil Co.
Standard Roller Bearing Co.
Schwartz Wheel Co.
Splitdorf, C. F.
Shelby Steel Tube Co.
Speed Changing Pulley Co.
Sprague Umbrella Co.
Steel Ball Co.
Timken Roller Bearing & Axle Co.
Toekim Mfg. Co. (The).
Tritt Electric Co.
Teel, E., & Co.
Universal Storage Battery Co.
Valentine & Co.
Veeder Mfg. Co. (The).
Ventilated Cushion Co.
Volta Battery Co.
Vesta Accumulator Co.
Way Muffler Co.
Weed Chain Tire Grip Co.
Wheeler Mfg. Co.
Webb Co. (The).
Warner Gear Co.
Warner Instrument Co.
Whiteley Steel Co.
Whitney Mfg. Co. (The).
Wray Pump & Register Co.

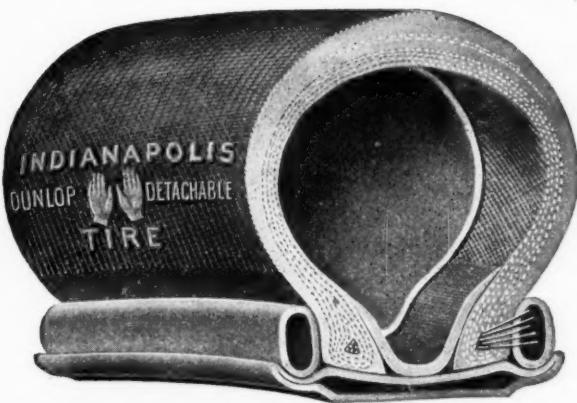
An Open Show. A Complete Show.

Usual courtesies to dealers, at morning sessions, application for which must be made at the office in First Regiment Armory. Further details of

S. A. MILES, Manager

New Southern Hotel, Chicago.

INDIANAPOLIS DUNLOP TIRE



**Open Steam Cured
Fitted with Flap
Wide Edges**

This tire is fitted with a flap, which protects the air tube from screw heads in the rim and from moisture, and does away with the necessity of fabric-covered tubes. The special edges and the flap constrict against the channel of the rim in such a way as to prevent creeping. It is entirely open steam-cured, which gives the tire exceptional strength. For full information apply to any of the following addresses:

**INDIANAPOLIS,
549 East Georgia Street**

CHICAGO
429 Wabash Avenue

DETROIT
247 Jefferson Avenue

BOSTON
43 Columbus Avenue

BUFFALO
9 West Huron Street

CLEVELAND
337 Huron Street

DENVER
1528 Court Place

MINNEAPOLIS
21 South Second Street

SAN FRANCISCO
327 Van Ness Avenue

PORTLAND
64 Sixth Street

LOS ANGELES
1038 South Main Street

National RELIABILITY

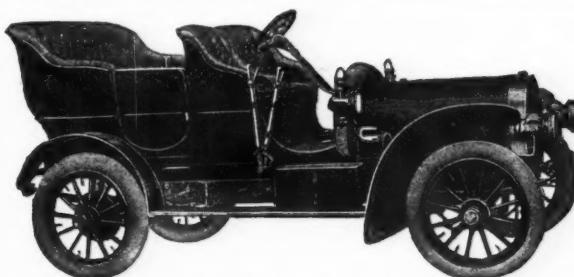
Was demonstrated in the most convincing manner at Indianapolis, on Nov. 16-17, 1905, when a **National Stock Car** made

1094 3-16 MILES IN 24 HOURS
Breaking the World's Record by 78 9-16 Miles

At the
**NEW YORK
SHOW**
69th Regiment
Armory
Jan. 13th to 20th

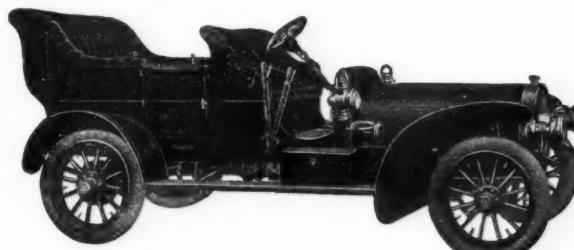


At the
**CHICAGO
SHOW**
Coliseum
Spaces 77-78-79
Feb. 3d to 10th



NATIONAL MODEL D, 4-CYLINDER, 35-40 H. P. PRICE, \$3,000.

The Car That Broke the World's Records



NATIONAL MODEL E, 6-CYLINDER, 50-60 H. P. PRICE, \$4,000.

An Innovation in Touring Cars

Stylish, powerful, smooth running, easily controlled. Aluminum body, seats seven passengers. ALL FACING FORWARD.

Write for particulars

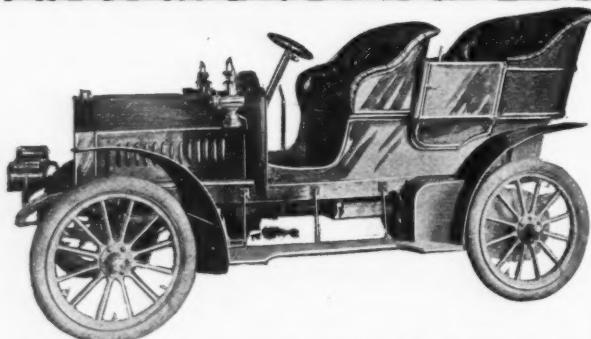
NATIONAL MOTOR VEHICLE CO.

1006 E. 22d St. INDIANAPOLIS, IND.

DISTRIBUTORS—Linscott Motor Co., 163 Columbus Ave., Boston; Homan & Schulz Co., 38th & Broadway, New York; Ralph Temple Auto Co., 311 Michigan Ave., Chicago; Tioga Auto Co., Broad & Tioga Sts., Philadelphia; The Fisher Auto Co., 330 N. Illinois St., Indianapolis; Liberty Auto Co., 138 Beatty St., Pittsburgh; Colonial Auto Co., 3944 Olive St., St. Louis.

Members American Motor Car Manufacturers' Association, Chicago.

THE 1906 CRAWFORD TOURING CAR



FINEST CAR IN THE WORLD AT
\$2 0 0 0

A Perfect Car at a Popular Price
SPECIFICATIONS COMPLETE

MOTOR: Four-cylinder, upright, water-cooled, 4½ by 4½ individual cylinders. 24-28 Horsepower.

CRANK SHAFT: Four throw, bearing in five bronze bushings aggregating 14½ inches.

CRANK CASE: Removable without disturbing adjustments.

WHEEL BASE: 100 inches; tread 56 inches.

WHEELS: 34-inch, wood, artillery type, on large ball bearings.

TIRES: Optional; regular clincher or mechanically attached.

DRIVE: Double chain on generous-sized sprockets.

TRANSMISSION: Selective sliding gear set, three forward speeds, one lever control, ball bearings.

BEARINGS: Ball bearings throughout.

BRAKES: Two powerful brakes on rear hub, with set lever. Two band brakes operated by foot on cross shafts.

LUBRICATION: Force feed lubricator.

FRAME: Deep section pressed steel sides, with an angle iron sub frame brazed up to carry motor and transmission, which are connected by double universal joint.

CLUTCH: Of inverted type, made dust-proof by leather diaphragm and operated by foot lever.

IGNITION: Jump spark, with four coils on dash.

CONTROL: Throttle and spark.

SPEED: 36 miles, approximate maximum.

SEE US
at the

A. C. A. SHOW
in 69th Reg. Armory
NEW YORK

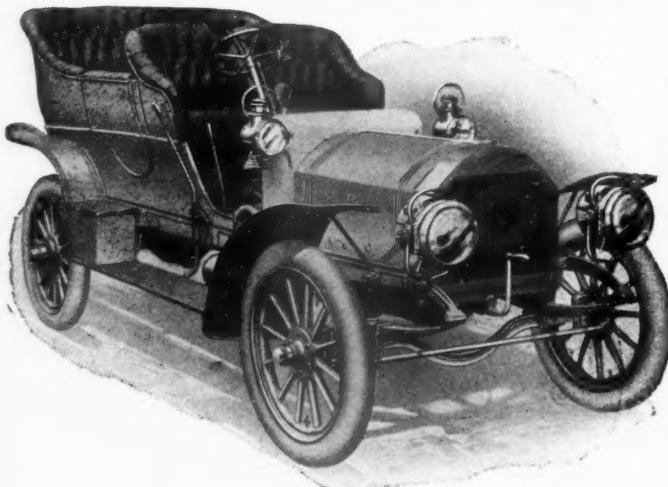
WEIGHT: 2100 lbs.
TANK CAPACITY: 14 gallons.

STEERING GEAR:
Wheel and pinion.

AXLES: Large sized tubing.

CORRESPONDENCE SOLICITED

Crawford Automobile Co.
HAGERSTOWN, MD.



Again—"As good as it looks"

Stoddard-Dayton

MODEL D

Touring Car

has more than beauty-lines to recommend it.

But, if you will look at its picture above, you are bound to agree that it is just about the handsomest, trimmest, most luxuriously-inviting vehicle that four wheels ever carried.

Note the exquisite modeling of the body, the clean, symmetrical lines of the frame, the vigorous and altogether stunning effect of the entire car.

Note—you cannot see it in the cut, but in the car itself—the delicate pearl-gray of its finish (16 paintings to attain that lustre!) See how this Quaker garb is relieved by the effective contrast of rich tan upholstering. Other colors optional with purchaser.

And then remember that artistic appearance is the least of the Stoddard-Dayton's virtues.

It IS "as good as it looks."

Every Stoddard-Dayton car must perform, and proves its ability to perform, before it leaves our factory. This is done by exacting block tests for motor, and road tests for car before final finish is applied.

The Stoddard-Dayton Model D, 5-passenger touring car has a special type of 4½x5 in. 4-cylinder motor; water-cooled; frame of hot-rolled, high carbon, pressed steel; sliding gear transmission, three speeds and reverse—selective type, can be changed instantly from high to intermediate, or vice versa, at speed of 25 miles, up hill or down, without clashing or friction; practically noiseless; entire transmission on roller bearings; mechanical lubrication; 30-35 horse power. Proportion of power to weight, one horse power to every sixty pounds. \$2,250. Immediate delivery.

Write for our 1906 catalogue. It's full of interest to every motorist. Sent free on request.

The Dayton Motor Car Co.
DAYTON, OHIO

AGENCIES IN THE FOLLOWING CITIES:

McDuffee Automobile Co., 1449 Michigan Avenue, Chicago; Stoddard-Dayton Agency, 1853 Broadway, New York; Hamilton Automobile Co., 200 North Broad, Philadelphia; Central Automobile Co., 5989 Centre Avenue, Pittsburgh; J. A. Cramer, 737 Main Street, Buffalo; Randliff Motor Car Co., 24 Columbus Avenue, Boston; Colonial Automobile Co., 3944 Olive Street, St. Louis; Derville Automobile Co., Omaha; H. S. Moore, 160 Crawford Road, Cleveland; Automobile and Supply Co., 24 Temperance Street, Toronto; Norman W. Church, Hellman Building, Los Angeles, Cal.; Haynes Automobile Co., 220 South 6th Street, Minneapolis; C. M. Wood, Denver; Fisher Automobile Co., 330 North Illinois Street, Indianapolis.

The Simplest Engine
in the World

THE TWO-CYCLE ELMORE



When you understand that the two-cycle Elmore engine does away with 18 to 20 parts on each of the four cylinders; and absolutely eliminates all inlet and exhaust valves, with their attendant mechanism, you'll agree with us, won't you, that this is the simplest engine in the world?

Do we need to point out that this also reduces the cost of operation and upkeep to the minimum and makes the Elmore the most economical as well as the simplest of engines in the world?

From whatever standpoint you examine the two-cycle Elmore, equally impressive and sensational features present themselves. The four-cylinder car produces approximately as much power as would eight cylinders of the four-cycle type—produces it in a continuous and unbroken application that will carry the car indefinitely on the high speed under any and all road-conditions.

Again—it is the most successful self-starting engine in the world. Again—you can cut out one, two or three cylinders at will, both spark and gasoline. With one cylinder cut out the difference is imperceptible except in speed; with two out—barely noticeable. Do you see the economy of this?

Again—you can throttle the Elmore engine on the high speed down to two miles an hour. Again—the Elmore will take a 16 per cent grade on the high speed with approximately as much ease as it travels on the level road.

It starts with a smooth, gliding motion that is delightful; and dips down and over uneven spots with a minimum of jolt or jar.

The four-cylinder Elmore at \$2,500.00 and the two-cylinder Elmore at \$1,500.00 are two cars whose manifold exclusive features demand your most serious consideration. Learn all the wonders of the two-cycle type by getting in touch with the nearest Elmore agent or by writing for our new descriptive catalogue and books of information.

The Elmore Mfg. Co.

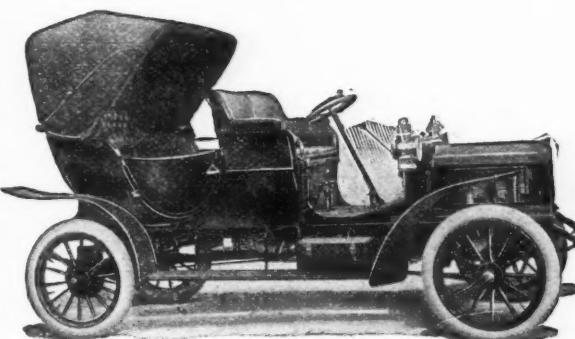
804 Amanda Street, Clyde, Ohio

MEMBERS A. L. A. M.

THE INCOMPARABLE

WHITE

THE CAR FOR SERVICE



THE REASON WHY

People often inquire, "Why is it that the longest tours, the hardest tours, the pioneer tours, the most interesting tours are made in White Steamers?" The answer is simple: because our standing has always been to design a car for extraordinary road conditions. That is why the White cars go ahead where other cars, designed only for ordinary road conditions, turn back. Another reason is that steam power, as utilized in the White car, possesses certain inherent advantages which cannot be realized through the use of other motive powers, no matter how highly developed the mechanism may be.

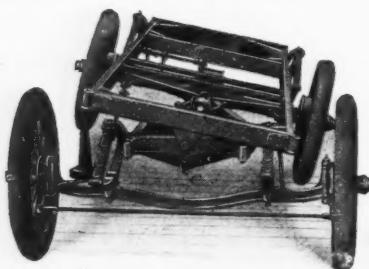
That readable publication, the White Bulletin, describes graphically some of the more notable tours of recent years, with maps and other data of interest to all tourists. If you have not seen the last three or four issues, it would be worth your while to send us a postal asking for them.

We will exhibit at the Armory show
in New York.

**WHITE SEWING
MACHINE COMPANY**
CLEVELAND, OHIO

THE MARMON

"A Mechanical Masterpiece"



Can Your Car Do This?

This is a good question to ask the demonstrator before buying.

In most of our illustrations we have used a view showing a front wheel raised, tilting the lower frame, but leaving the body frame level.

This shows a rear wheel raised over a foot, tilting the body frame, but leaving the lower frame level.

All roads afford many parallels for this condition.

Observe that raising one wheel does not affect the other three wheels in the slightest. Observe that no matter what wheels are raised, no matter which frame is tilted, the power plant and rear axle are maintained in perfect alignment, doing full duty without strain or undue friction in any part.

Another point, it is not left to the springs and tires to bear the shocks entirely. The flexibility of the gear relieves them to a remarkable degree. Nor do the springs bear the driving strain, as this is direct from rear to front axle through radius rods.

Any Marmon owner knows, when he is speeding along over rough roads with an easy, gentle sway unknown in any other car, that the entire mechanism is equally at ease, conserved for a long and useful life.

The reason for this important elasticity lies in no mere combination of springs, but in the exclusive patented feature

Double Three-Point Suspension

Luxurious cast aluminum body on one frame, power plant on another frame, each frame suspended on three pivotal points. Eliminates the binding and twisting strains inevitable in the rigid suspension of all other cars; means simpler parts, fewer parts and less wear on all parts, tires included. A straight, rigid shaft drive without Cardan joints and an inner driving axle that bears no weight, deliver a greater percentage of the power of the motor to the wheels, than is possible in any other scheme of transmission.

The Marmon four-cylinder motor never overheats or "sticks," due to perfect air-cooling and an oiling system that is unlike any other and superior to any other the world over.

The Marmon is stylish, strikingly handsome, and very quiet. It is replete with distinctive features that appeal instantly and forcefully to all who seek a strictly high-grade car.

Write for Booklet No. 1 and become posted on a real Twentieth Century Automobile.

We shall demonstrate at the Armory Show, New York.

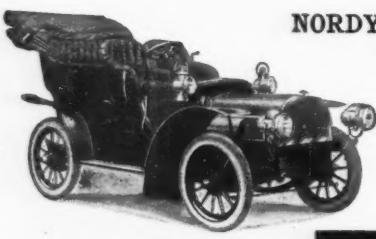
Four Cylinders { Model C, Four Passengers, \$2,500
Air Cooled { Model D, Five Passengers, 3,000

NORDYKE & MARMON CO.

Established 1851

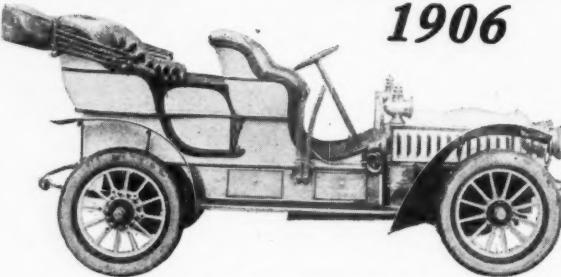
Indianapolis, Ind.

Members
American Motor Car
Manufacturers' Association



"Sixty Miles an Hour"

The Austin 1906



Model LX. Touring Car

Finished in White with Tan Trimmings—an aristocratic effect

60 H. P. \$4,500

Capacity, 5 persons EASILY. Wheel base, 109 inches. Four cylinders. Water cooled. Four forward speeds. Brakes to rear wheels and on driving shaft. Irreversible steering.

Two Separate Complete Ignition Systems.

High tension magnets on one set of plugs, and batteries and vibrating coil on another set of plugs.

"You can't go wrong if you select an Austin"

Send for Catalogue that talks

Austin Automobile Co.
Grand Rapids, Mich.

Automobile Knowledge

means
Money in Your Pocket

We are the only school that provides complete, practical, money-earning and money-saving training by mail in operating, repairing, constructing, and designing every kind of motor vehicle and motor boat.

We have special courses for owners, shop and factory employees, chauffeurs, motor boat and motorcycle users, and others.

There are only two ways of learning anything. One is slowly and tediously to gain the experience yourself; the other (and better) way is to take advantage of the experience of others.

Though we offer you the long, hard-learned, thorough experience of experts who have done prominent work in the development of the new vehicle, we offer this experience in such form that to teach it to you will take only a few minutes and cost only a few cents each day—the few minutes and the few cents that you ordinarily waste.

Our instruction has been prepared and is conducted by well-known men, of long experience and proved ability both in automobile engineering and correspondence instruction. It is strongly endorsed by prominent manufacturers, club and association officials, racing men, trade-paper editors, and others whose standing in the automobile field lends authority to what they say.

In the automobile industry, the demand for competent men is so great that ability, no matter how acquired, is considered above "pull" and length of service. This makes it easy for an ambitious man to qualify quickly for good wages and prompt advancement.

For further information, send us your name on the accompanying coupon. This will cost you only a moment of time and a postage stamp, which will be well spent for interesting and convincing literature.

FILL OUT TEAR-OFF MAIL TO-DAY

The Correspondence School of Automobile Engineering
Suite 1346 Flatiron Building, New York City

Please send to my address by return mail, a free circular, giving full particulars of your correspondence courses.

Name.....

Street and No.

City..... State.....

or write for circular without sending coupon



**A ONE CURE TIRE
With Wrapped Tread**

**LONG SOUGHT
SUCCESSFULLY ACHIEVED**

1906

Hartford DUNLOP CLINCHER Tires

Will be so produced at

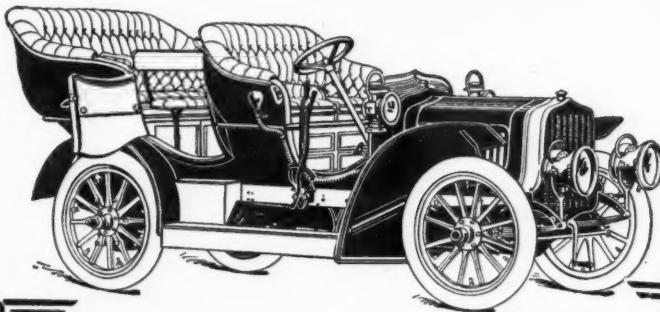
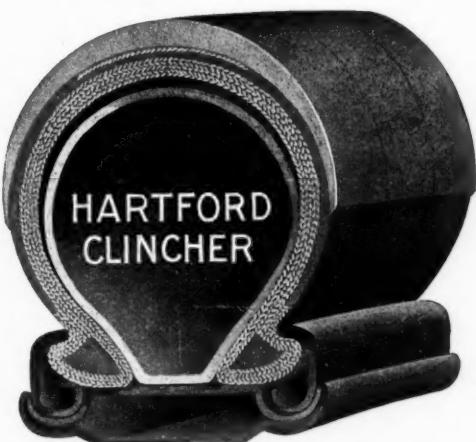
ONE VULCANIZATION

Both types will fit

The Hartford Universal Rim

**The Hartford
Rubber Works Company**

Hartford ... Conn.



POPE-TOLEDO

Type XII. 35-40 Horse-Power. Price, \$3500

THIS car is absolutely the FASTEST and most POWERFUL touring car ever built. Think of a STOCK car with regular gearing doing 76 miles an hour. Isn't this convincing that the power the POPE-TOLEDO motor develops is transmitted to the wheels? TYPE XII will carry seven people at 30 miles an hour, and its noiseless, smooth-running engine will be scarcely more exerted than when idling.

Car has 54 pounds of total weight per horse power, only 10 8-10 pounds engine weight per horse-power.

The wheel base is only 104 inches. Yet the car seats comfortably seven people, with room to spare.

Double Direct Outside Chain Drive, of course; and a TRANSMISSION made of specially treated steel of 225,000 pounds tensile strength, the strongest, most efficient, smoothest running transmission ever constructed.

Send for catalogue of

	PRICE
20-25 H. P. Double Side Entrance,	\$2800
30-35 H. P. Front Entrance,	3200
35-40 H. P. Double Side Entrance,	3500
50-60 H. P. Double Side Entrance,	6000

Order NOW for early delivery

Be sure the name "POPE" is on your automobile

Pope Motor Car Company

TOLEDO, OHIO

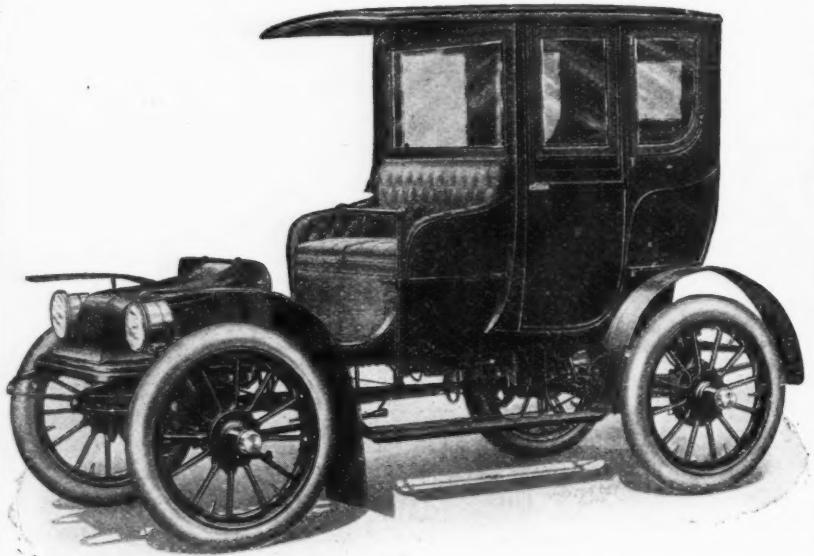
NEW YORK CITY 1733 Broadway
BOSTON, MASS. 223 Columbus Avenue
WASHINGTON, D. C. 819-14th Street N. W.

Members Association Licensed Automobile Manufacturers.

BAKER ELECTRICS

The ARISTOCRATS
OF MOTORDOM

Imperials...Stanhopes...Surreys...Depot Carriages...Broughams



Our Depot Carriage is the acme of refined, quiet elegance. Its every appointment is correct. Its finish and upholstery are the best that money can buy and the most skillful labor execute by hand. Its mechanical construction is as nearly perfect as long experience in the manufacture of electric vehicles enables us to make it.

All BAKER ELECTRICS are extremely light in weight, yet made from such carefully selected materials, with the utmost care and attention to every detail that they are extremely efficient and durable.

The absolute simplicity of operation and ease of control adapts BAKER VEHICLES for the use of anyone and a skilled chauffeur is never necessary.

We desire agents in a few important cities not yet covered and will be pleased to correspond with all who care to arrange for the best and easiest selling line of vehicles in the market.

The Baker Motor Vehicle Co. 24 Jessie Street **Cleveland, O.**

"THE OLD
SHOW
IN THE
NEW ARMORY."



SIXTH ANNUAL
Automobile Show
OF THE

Automobile Club of America

Sixty-Ninth Regiment New Armory
Twenty-Sixth Street, Near Fourth Avenue



THE OPEN
EXPOSITION
OF A
GREAT INDUSTRY

NEW YORK CITY

January 13 to 20, 1906

Leading American and Foreign Exhibitors
Gasoline—Steam—Electricity

896

Wheels were fitted with **CONTINENTAL TIRES** at the Paris Automobile Salon, December, 1905. Other tires represented were 676, 361 and 252 respectively.

Paris is the world's market for the greatest number of high-grade automobiles and since the French manufacturers thus recognize a German tire, the reason therefore is self-evident. YOUR tire equipment for 1906 should be **CONTINENTAL**.

THE CONTINENTAL CAOUTCHOUC CO.

EMIL GROSSMAN, Gen. Mgr.

43 WARREN ST., NEW YORK

Factory: Hanover, Germany

WE WILL EXHIBIT at Madison Square Garden, New York, January 13-20, 1906, Space 147; 69th Regiment Armory, New York, January 13-20, 1906, room "1;" Coliseum, Chicago, February 3-10, 1906, spaces 274-278.

American Mercedes

IF YOU WANT A MERGEDES
Buy it Here and Save the Duty

All the speed, all the strength, all the lightness and all the beauty of the imported 1906 Mercedes are repeated in the 1906 American Mercedes. Every working part in the one has its counterpart in the other. No test of endurance that can be applied to these two cars will bring out a difference between them. Every patent, every device, every method of construction used by the Daimler Motoren Gesellschaft in building the Mercedes is used by us in building the American Mercedes.

We have the sole ownership for the United States and Canada of all patents, designs and shop drawings of our parent company.

Through the rights granted us by our parent Company, the Daimler Motoren Gesellschaft, we have during the past year convinced the most prejudiced and skeptical buyers of foreign automobiles that the American Mercedes is the equal in every respect of its counterpart, the imported Mercedes.

There is only one difference — you save the duty.

The 1906 American Mercedes will be exhibited at the Automobile Show.

DAIMLER MANUFACTURING CO.,

N. Y. City Garage, 10 West 60th St.

973 Steinway Ave., LONG ISLAND CITY, N. Y.

SECTION OF LOCKING RING

SECTION OF RIM

COMPLETE WHEEL

TOOL

G, H, A, A', C, D, E, F, X

Your Tire Off and On in Less than a Minute

Tells exactly what is accomplished
by means of the

Goodrich Quick Detachable Construction

And a visit to our Exhibit at the New York Automobile Show, Madison Square Garden, will afford you the opportunity to see our claims proved.

Perhaps you may wish to make dead sure and detach and attach the tire yourself. It is a pleasant little pastime with all the old time hard work features cut out. You will enjoy the experience and be impressed with the fact that the Goodrich Quick Detachable Tire and Rim is a great achievement in automobile tire building.

Space in Central Boxes directly
over Madison Square entrance.

**The B. F. Goodrich
Company, Akron, O.**

New York, 66-68 Reade St. and
1625 Broadway
Buffalo, 731 Main Street
San Francisco, 392 Mission Street
Boston, 161 Columbus Avenue
Philadelphia, 909 Arch Street
Cleveland, 416 Erie Street
Chicago, 141 Lake Street
Detroit, 80 East Congress Street
Denver, 1444 Curtis Street
London, E. C., 7 Snow Hill

Compound Doctor's Stanhope

JOSEPH E. ROOT, M. D.
67 Pearl Street HARTFORD, CONN.

December 12, 1905.

Mr. Schull, Mgr. E. H. V. Co.:

Dear Sir—I thought it might be of interest to you to know how my "Doctor's Stanhope" was progressing.

I am pleased to voluntarily state that it is way beyond my expectations, high as they were. You understand I'm a "greenhorn" at running a motor car, and it's pulled me every day in town and out—on my professional rounds—always brings me home—never has had to go to a garage or repair shop for adjustments, etc.—goes through the cold and snow (the latter with chains on) just the same. It continues to ride as easy and warm as a hack. My total running expenses for my first month, ending December 8th, were \$8.86. Upwards of six hundred (600) miles were covered.

Thanking you for furnishing me such a competent, durable and elegant machine, I am,

Yours, etc.,

JOSEPH E. ROOT, M. D.

THE E. H. V. CO., Middletown, Conn.



12-15 H. P., \$1,400

HAYNES

HAS AN EXCLUSIVE TRANSMISSION

If an automobile weighing 2,750 pounds, plus the weight of five passengers, is dropped over a sheer embankment of 7 feet, the machinery will receive a shock of just the same severity as if suddenly checked by shifting from high speed gear at 30 miles per hour to middle speed gear at 15 miles per hour. In the latter case the engine must act as a brake, and the entire machine is severely strained.

With the Haynes transmission, this cannot occur. A ratchet and pawl device permit the car to coast until the speed of the car and engine are relatively equal, when the pawls engage and the engines take up the load. While making the change in speed from high to middle or from high to low, the gears are running idle, permitting the operator to shift with perfect ease and without danger of burring or stripping the gears.

With all forms of transmission except the Haynes, the shock of sudden change of gears may be, and frequently is, thrown upon the machine, a thing impossible in the Haynes car and one of the reasons why Haynes cars are so long lived and cost so little for repairs and up-keep.

This is but one of the exclusive features of the Haynes. Others are its Roller-Bearing Engines, Master Clutch, Universal Joints that do away with wear on pins, Driving Sprocket and Roller Pinion, etc. There is perfect harmony throughout its entire mechanism, which makes its cost of operation, up-keep and maintenance extremely low.

It is perfectly finished in all respects. Only the best of materials are used. Body is of cast aluminum and wood, designed by a leading Parisian body maker. Hand-buffed leather and gray curled hair are used in upholstering. Other exclusive features are given in our new catalogue. For prompt attention address Desk 25.

"The Car the Repairman Seldom Sees"

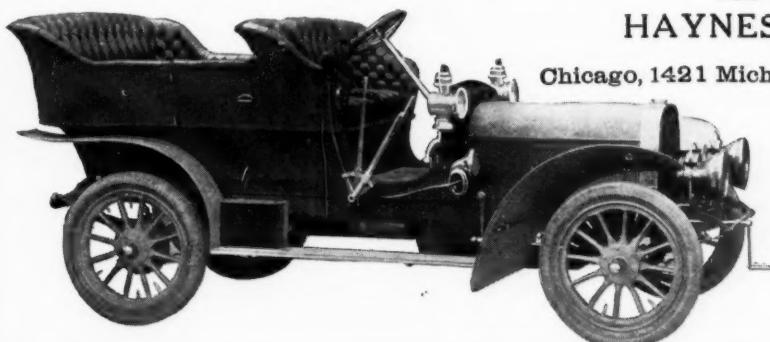
HAYNES AUTOMOBILE COMPANY

KOKOMO, INDIANA

Chicago, 1421 Michigan Ave.

New York, 1715 Broadway

MEMBERS A. L. A. M.



MODEL R—FOUR-CYLINDER TOURING CAR

Vertical roller-bearing engines. Cylinders cast separately, $5\frac{1}{2} \times 6$ inches, 50 H. P. An exclusive transmission that absolutely prevents stripping of gears. Positive cooling system. Individual and special lubrication. Master clutch has metal faces and takes hold without jerking. Shaft drive. Exclusive universal joints that prevent wear on pins. Sprocket and Roller Pinion and perfect Rear Axle, all exclusive. Roller-bearings throughout. 108-inch wheel base, 54-inch tonneau, seating five people. Four to sixty miles an hour on high gear. Weight, 2,750 pounds. Price, \$3,500, f.o.b. Kokomo. Full equipment.

We believe that a very large portion of the tire-trouble suffered by motorists is due to their ignorance in regard to the care and proper manipulation necessary for the preservation of motor-tires.

We also believe that, with the proper encouragement and instruction from the manufacturer, the driver of a car can materially reduce his tire-expense, which is now so large an item in the cost of operation.

We have, therefore, decided to offer cash prizes to the amount of

\$1000.00

for a *Tire Economy Competition* to continue throughout the year 1906.

Every owner or driver of a motor car is eligible to enter this contest.

The prizes will be awarded according to the tire expense per running mile. Contestants may enter at any time during the year, but must complete 2,500 miles before the close of the competition.

We will forward particulars of this competition and instructions for the care of tires on request.

PENNSYLVANIA RUBBER CO., Jeannette, Pa.

Four to One

"Firestone" Side Wire Tires

have a record that demonstrates. Four out of every five commercial automobiles are fitted with these tires. Isn't this a demonstration of their superior merit? Isn't this evidence of the durability and abiding satisfaction found only in "The Firestone."

THEN WHY NOT "FIRESTONE?"

FIRESTONE TIRE & RUBBER CO.....Akron, Ohio

NEW YORK CHICAGO BOSTON ST. LOUIS PHILADELPHIA DETROIT



Timken-Lemoine Front Axle (Roller Bearing)

TIMKEN Axles and Roller Bearings are simply perfect in principle, design, construction and in operation. They do what others almost do.

That's why they meet the requirements of exacting engineers of the leading automobile manufacturers. They're made a little better than seems necessary—result, they do what others almost do.

We have an efficient hustling corps in our selling organization, on the theory that our business is to assist you to increase your business.

Put the burden of the proof on us, use our axles and bearings and your experience will be that of thousands of others—not a dissatisfied customer.

Write us about it. Direct drive axles, divided and solid rear axles, knuckles, special bearings and cups, wheels and channel rims.

Timken Roller Bearing Axle Co.

General Office and Works, Canton, Ohio

Southern

To be exhibited at the Madison Square Garden, N. Y., January 13 to 20, and at Chicago

Better than ever. Motor has been enlarged, affording 20 h. p., and with a wheel base increased to 106 inches and longer and heavier full elliptic springs it will fully sustain its reputation of being "the quietest and easiest running car in the world."

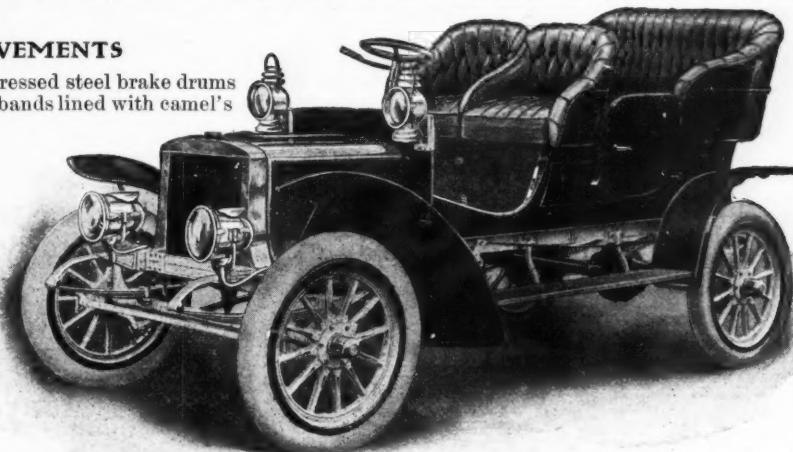
OTHER NOTABLE IMPROVEMENTS

Brake pedal fitted with ratchet and pawl; pressed steel brake drums on rear wheels with external contracting brake bands lined with camel's hair belting three inches wide, affording an exceptionally large and efficient braking surface; bodies ironed for tops; improved catches on side entrance doors.

Write for Catalogue No. 14 and full information about

1906 MODELS

7 h. p. Sturdy Northern Runabout with lamp equipment	\$ 650
20 h. p. two-cylinder car, with gas and oil lamp equipment	1800
20 h. p. Limousine, with gas and oil lamp equipment	2600
Model K, 30 h. p. four-cylinder car, with gas and oil lamp equipment	5000



Silent Northern Touring Car,
double side entrance, 4-inch tires,
gas and oil lamp equipment

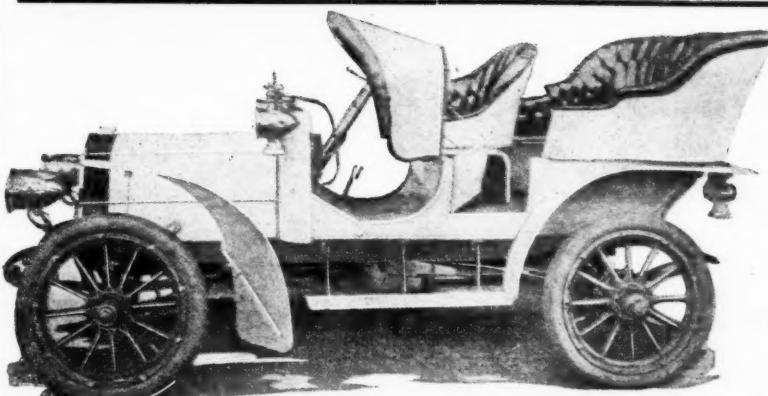
NORTHERN MANUFACTURING CO., Detroit, U. S. A.

Member Association of Licensed Automobile Manufacturers

Chicago Agents: KELLEY-HUNTER CO., 1449 Michigan Avenue



The Engine Starts from the Seat by Forward Pressure on a Foot Lever. No Crank Necessary



The 1906 Duquesne

SPECIFICATIONS

16-21 H. P. 4-cylinder 4-cycle vertical motor, air-cooled.
VALVES—Intake and exhaust mechanically operated, interchangeable. Primary exhaust automatic.
IGNITION—Jump spark. Dry batteries.
CARBURETER—Float feed, spray type, automatic, very efficient.
TRANSMISSION—Planetary, all spur gears, running in oil.
SUSPENSION—Three-point flexible.
DRIVE SYSTEM—Direct drive by band gears and Duquesne triangular system.
SPEED—8-40 miles per hour.
STARTS from the seat with forward pressure on foot pedal.
BODY—Double side entrance, seats five comfortably.
COLOR—Optional.
WEIGHT—1,750 pounds.

BRAKES—In addition to two powerful expanding brakes on rear wheels that suffice to hold the car anywhere, the rear wheel brake drum, on either side, is fitted with internal cut ratchet teeth, that will positively hold the car on any hill, however steep. This is especially desirable in case of accident or should the motor stop for any cause, as it absolutely prevents car from running backwards.

CONTROL—Spark and throttle lever are arranged on top of steering wheel, but independent of the latter. The gear operating lever is arranged immediately below the wheel; the backward movement of this lever gives the slow speed forward, the forward movement the high speed. The reverse and brakes are operated by foot pedals.

INTERCHANGEABILITY—Every part that enters into the mechanism of the Duquesne is standard and interchangeable. This is a great convenience, especially regarding repairs, and we are in position to forward repair parts the day order is received—a little big thing.

PRICE, \$2,000 with full equipment. Two acetylene lamps, generator, oil side lamps, horn and tail lamp



DUQUESNE CONSTRUCTION COMPANY
JAMESTOWN, N. Y.



Make your own gas

The Neverout
TRADE MARK
Patent Invertible

Safety Gas Producer

is the only safe method for lighting motor-cars and boats.

Makes gas only as needed—at a cost of less than $\frac{1}{2}$ cent per hour. No gas confined under pressure, no danger of explosion. Instantly lighted and extinguished.

No trouble, no dirt, no odor

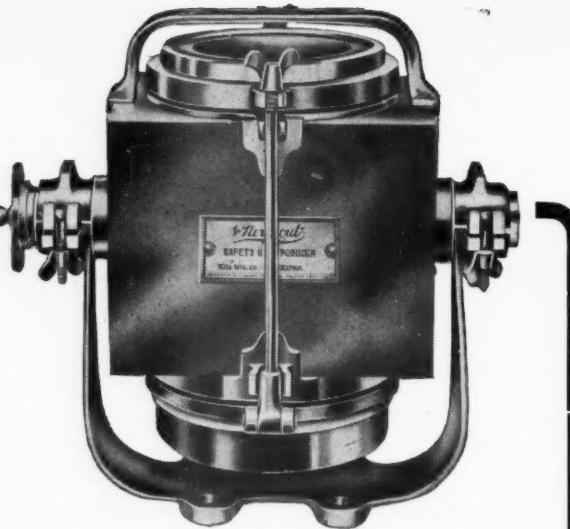
A truly great invention that is as wonderful in its way as is

Neverout Mirror Lens Searchlight

the most powerful of all light projectors. Money back if not satisfactory. Write for free booklet.

Largest Searchlight Factory in the World

ROSE MANUFACTURING CO., 912 Arch Street, Philadelphia



To our friends in particular and "the Trade" in general:

We Wish All a Bright, Happy, and a Successful New Year.

May It Prove a Year of Progress and of Satisfactory Results to All.

The Fisk Rubber Company . . . Chicopee Falls, Mass.

(Makers of the Fisk Mechanically Fastened Tires)

The Automobile WASHSTAND-TURNTABLE

It greatly increases the capacity of a garage by saving the space otherwise required for maneuvering cars. It also permits a car to always face the door, thereby avoiding the inconvenience and danger of accident incident to backing it, when the approach is difficult.

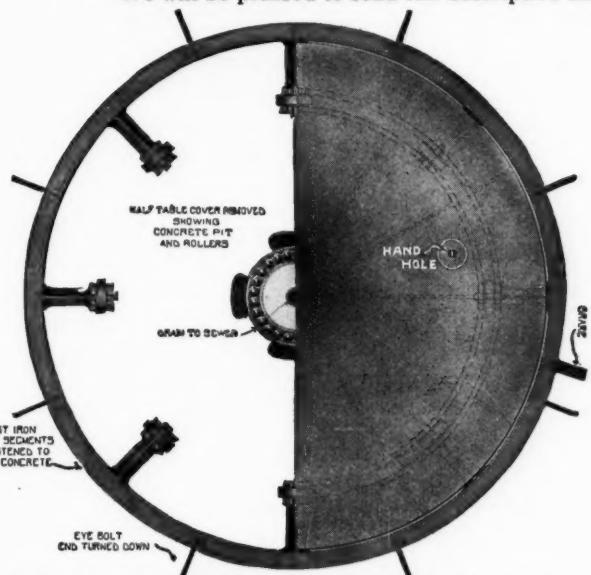
The table is of cast-iron supported by a ball-bearing pedestal in center and rollers near its outer edge. It rests in a concrete pit about 12 inches deep, the edges of which are protected by an iron ring or curb as shown.

It moves easily, is practically indestructible and is absolutely fire-proof.

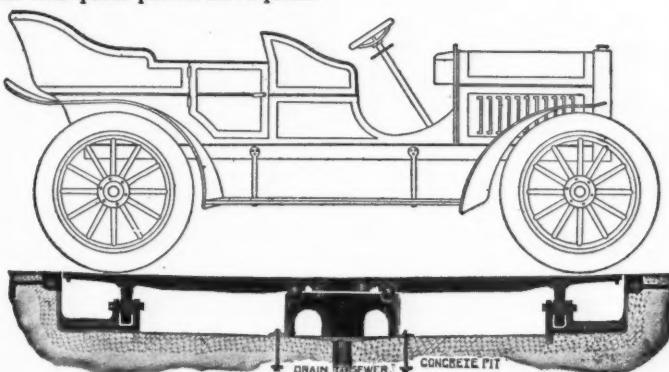
It greatly facilitates the washing of cars, all water from surface of table and garage floor passing to sewer through a drain pipe in center of pit.

We make Washstand-Turtables and also plain turntables (without the washstand feature) for wheel bases up to 126 inches.

We will be pleased to send full descriptive matter and quote prices on request.



Sectional views of WASHSTAND-TURNTABLE. Patent applied for.



LINK-BELT
Machinery Co.
CHICAGO

MICHELIN

Go Faster—Last Longer

Why? MORE PURE RUBBER
EXCLUSIVE FABRIC
SUPERIOR VULCANIZATION
UNEQUALED WORKMANSHIP



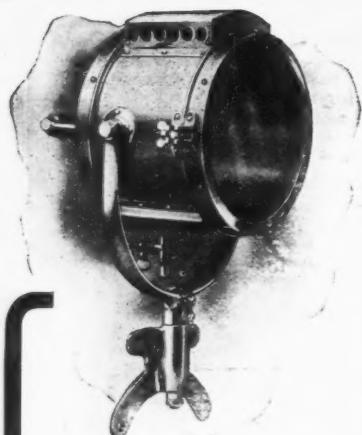
MICHELIN TIRE AMERICAN AGENCY, Inc.

Telephones: 760-761 Madison Sq.

6 WEST 29TH STREET, NEW YORK

E. D. WINANS, Gen'l Mgr.

Branches in all large cities



WHY IS IT —

that, three times out of four, when an owner **names** the lamps on the car he advertises for sale, the name is

RUSHMORE?

It's because RUSHMORE Lamps Help to Sell the Car!

The Rushmore has a short focus lens mirror, ground in our own factory, and identical in everything but size with those prescribed by Uncle Sam for his battleships.

No other lamp compares with it in brilliancy and carrying power. Specify it on your new car.

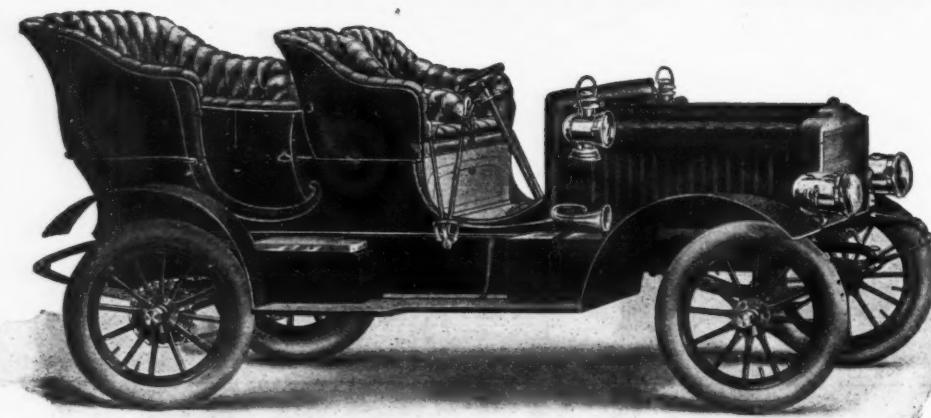
1906

Models
Ready for
Delivery

THE LAMBERT

**The Famous
Friction Drive Car**

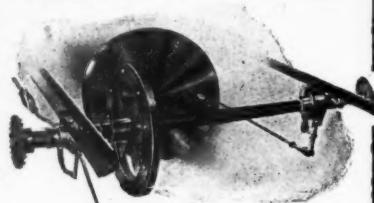
It will pay you to investigate the Lambert for two reasons:
1st. Simplicity of Construction 2d. Cost of maintenance



Model 7. 34 H. P. Price, \$2,000

This car has a 14 inch road clearance, capable of making 55 miles per hour, and has a detachable tonneau.

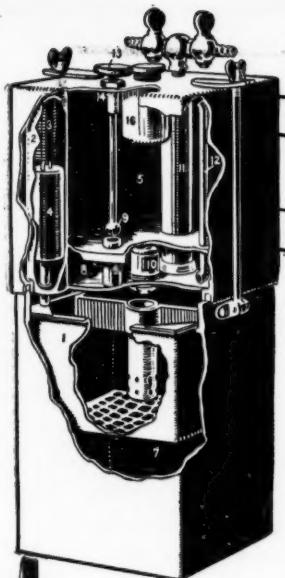
Write for descriptive matter on the above models.



A Gearless Transmission

THE BUCKEYE MANUFACTURING CO., Anderson, Indiana

Members American Motor Car Manufacturers' Association, Chicago



HERE IT IS—

That "Trouble-Proof" Rushmore Generator

We haven't room to tell you about all its unique points of merit, but you can't afford to miss these three:

FIRST: The shaking carbide basket 1, hung by opposite corners and jarred constantly while the car is moving by the weight 4, hung on spring 3. This insures the instant separation of the lime dust from the carbide, and prevents the local overheating, caking of lime, and production of tarry compounds, with which you are probably familiar in other generators.

SECOND: The regulating chamber 8, separated from the water tank 5 by a false bottom, through which the water passes by the shut-off valve 9 and tube 6. To reach the carbide, the water must overflow the short central standpipe 10, and when the gas reaches normal pressure it forces part of the water back through tube 6 to the tank, uncovering the top of standpipe 10. No water can thereafter reach the carbide save through a reduction in the gas pressure, and the action is perfectly automatic, requiring no hand regulation.

THIRD: The safety vent pipe 12, ordinarily not needed, but useful in case of any accidental accumulation of gas when valve 9 is closed.

Every one of these features is essential to a perfectly automatic portable generator.

Every one of them is broadly covered by Rushmore patents and cannot be imitated.

Our catalog tells other good points. Write for it.

RUSHMORE DYNAMO WORKS, :: Plainfield, N. J.



On the Ormond-Daytona Beach, Florida,
January 22d to 27th, 1906

**The Annual Aristocrat of Race Meets
Where Speed Kings are Crowned**

Plan a brief vacation Escape cold weather for a few days by a trip to balmy Florida You will see nature's finest automobile speedway Why not take your car with you? For all particulars as to Railroad, Steamship, Hotel Accommodations, Programs of Meet, etc.,

Address ... W. J. MORGAN, Gen'l Manager, 116 Nassau Street, New York
Representing the Florida East Coast Automobile Association

Insurance against freezing troubles

The best way to protect yourself against the danger of the water freezing in the circulating system of your car, and the trouble and inconvenience which it brings on, is to use

No-Mor Auto-Freeze

One charge of this solution does the work for all winter and you don't need to be afraid of zero weather or even 10 degrees below.

No-Mor Auto-Freeze not only saves you the money that it costs to heat your barn, but prevents the bursting of water pipes and saves you the dollars it would take to make the necessary repairs.

Chemist's Report

THE GENERAL LABORATORY CO.
Chemists
125 Quebec St. Cleveland, Ohio

"We have examined and tested No-Mor Auto-Freeze and find that it will not corrode brass, aluminum, copper, galvanized iron or solder, and that it will remain fluid at 10 degrees below zero Fahrenheit. Another good feature of the product of this formula is that it will not crystallize out, hence no danger of clogging the circulating system."

It's cheaper to buy No-Mor Auto-Freeze than to take any risk. Your mind will be entirely at ease and you won't need to give another thought to your circulating system.

No-Mor Auto-Freeze is already dissolved, won't clog the circulating system and contains nothing to corrode the metal or injure the rubber.

75 cents a gallon, at dealers, or f. o. b., Cleveland, Ohio. Sold only in 5 and 10-gallon cans

Good thing for dealers

No-Mor Auto-Freeze is right in your line, and is an easy seller. Write for terms and full particulars.

OWEN CHEMICAL CO. 45 Vincent Street
Cleveland, Ohio

SIXTH NATIONAL Automobile Show

AT

Madison Square Garden

NEW YORK

JANUARY 13th to 20th, 1906

JAMES C. YOUNG, Manager

SPECIAL NOTICE. The trade admitted free up to 1 o'clock each day upon presentation of business card and registering name and address at the *Bureau of Information*

This AUTO TIRE is both DURABLE and LIVELY

When you buy an *ordinary* Auto Tire, you have to decide a difficult question.

Is it best to get a hard, inflexible tire, which will rack your bones and soon put your car out of business, but which will *last a season or more*?

Or—

To get a soft, resilient, easy riding tire, which will go to pieces in a short time because it won't stand the wear and tear of the road?

Momentous question.

And either way you answer it—you lose.

Because if you decide on the *hard* tire, it means breakdowns on the road, and consequent liberal use of a farmer's team. It means constant repairs to your engine, a car always in the shop. Your aching joints are thrown in for good measure.

And if you select the *soft* tire, it means punctures, tire explosions and tire troubles generally. And you have to buy new tires every little while.

It's Money—Money—Money, either way.

You'll envy Rockefeller before you get through.

Now you can *dodge* this momentous question if you will.

Because the Goodyear Detachable Auto Tire has all the GOOD points of

both the *hard* and the *soft* tire with the bad features of neither.

Dense, Tough Rubber **Soft, Springy Rubber**



It's easy for anyone to understand WHY this is true. Read carefully, and see for yourself.

First, look at the section of the Goodyear Tire in the center column. Notice the crescent shaped portion in solid black where the wear of the road comes. That's dense, firm rubber, as tough as rawhide—practically no wear out to it. It's what the *hard* tire is made from.

Now right underneath this is the remainder of the outer tube (shown in grey) which is made from pure *rubber*, as resilient and springy as it is possible for rubber to be. It's the same as the seldom-used *soft* tire.

These two different kinds of rubber—the dense, tough composition, to take the wear, and the soft, elastic rubber, to make you ride easy—are made into one solid piece by a special process. You can't skin the two kinds of rubber apart with a knife. Try it if you doubt.

The dense rubber and the soft rubber together make a tire that's almost as durable as a *solid* tire, a tire difficult to puncture yet one which is as *resilient* as a man could reasonably ask.

Our "Good News Book" tells more about the good points of this trouble-saving tire. You ought to get it now, for the Goodyear Detachable Auto Tire with Universal Rim will be "the only tire" next season.

THE GOODYEAR TIRE & RUBBER COMPANY, Wallace St., Akron, Ohio

Branches in the following cities: Boston, 6 Merrimac St.; New York, Cor. 64th St. and Broadway; Chicago, 110 Lake St.; Cincinnati, 242 E. Fifth St.; St. Louis, 712-714 Morgan St.; Philadelphia, 1521 Spring St.; San Francisco, Geo. P. Moore & Co., 596 Golden Gate Ave.; Buffalo, 719 Main St.; Denver, 220 Sixteenth St.; Detroit, 242 Jefferson Ave.

BAILEY TREAD furnished on Goodyear Tires (all sizes) when ordered

DOLSON AUTOMOBILES

THE NEW 1906 MODELS

MODEL F. 45-50 Horse Power, 4 Cylinders, 5" x 5"
110-inch Wheel-base, Aluminum Body, \$2,500

MODEL E. 28-32 Horse Power, 4 Cylinders, 4 1/4" x 4 3/4"
108-inch Wheel-base, Steel Body, \$1,800

MODEL D. 20-24 Horse Power, 2 Cylinders,
Opposed Under the Hood, \$1,500

MODEL C. 20-24 Horse Power, 2 Cylinders,
Opposed Under the Body, \$1,250

COMPLETE ADVANCE INFORMATION CONCERNING ABOVE MODELS IS READY

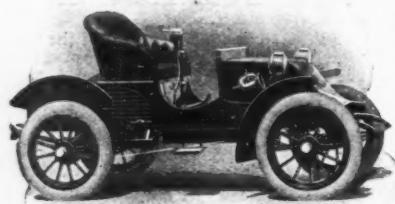
DOLSON AUTOMOBILE CO.

LORETT and PEARL STREETS

CHARLOTTE, MICHIGAN

ADAMS-FARWELL

THE "REVOLVING-MOTOR" CAR



Our system is no longer an experiment, as our cars are now being operated every day by satisfied customers. In proof of this let us send you copies of letters received from owners of 1904 and 1905 models.

Three and five Cylinders 20-25 and 40-45 Horsepower
Six Models \$2,000 to \$4,000—Highest Grade Only

No Water: No Radiator: No Fly-wheel: No Muffler: No Fan: Automatically Governed

CHICAGO SALESROOM: 1536 MICHIGAN AVE.

THE ADAMS COMPANY, Dubuque, Iowa, U.S.A.

Hill Precision Oilers

The first requisite in a mechanical oiler is **efficiency**. To be **efficient**, it must possess absolute reliability, and give perfect and unfailing service under all conditions.

The second requisite is **economy**.

The Hill Precision Oiler combines both of these requisites—and the feature of economy is not confined merely to the saving in oil used, but in cutting out from the repair bill those items that always result from faulty lubrication. Read this:

THE OSCAR LEAR AUTOMOBILE CO.

Automobiles
Corner Fourth and, Gay Streets

Columbus, Ohio, September 5, 1905.

The Steel Ball Co., Chicago, Ill.
Gentlemen:—We desire to express our sense of the great assistance your Oiler was to us in our recent 6-day endurance and economy run at Long Branch. In a run of 3,202 miles made in a little over 6 days, we only used 10 gallons of oil and your oiler delivered the oil in an unfailing measure as set. Its operation was perfect at all times. The importance of all this we fully realize and its help in getting this record for our FRAAYER-MILLER car.

Yours truly,
THE OSCAR LEAR AUTOMOBILE CO.

THE STEEL BALL COMPANY

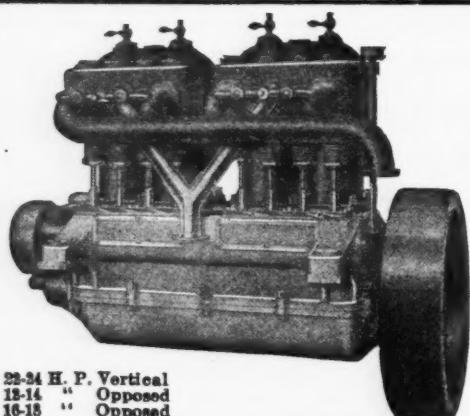
840 Austin Avenue
CHICAGO U. S. A.

DIETZ

THE
DIETZ
OIL LAMPS

are fitted with removable Aluminum Reflectors, drawn up out of very heavy gauge aluminum. The Reflectors can be taken out for cleaning without any trouble whatever and replaced just as easily. Those who have personally used Lamps made in the usual way can appreciate how great a convenience this is.

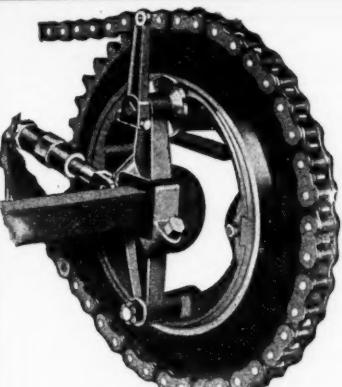
R. E. DIETZ COMPANY, 37 Laight St., New York
ESTABLISHED 1840



"DON'T DELAY" PLACING YOUR ORDER FOR BEAVER MOTORS

For your 1906 cars. Efficient, light and durable. Our prices will interest you. Performance and deliveries guaranteed. Correspondence solicited.

BEAVER MFG. CO., Milwaukee, Wis.



Made in three sizes

GARFORD PARTS

A few Garford parts in a high grade car enhance its value. Liberal use of them maintain it. Just now we have none for sale. High grade car makers snapped up all we can make this season just as soon as they were offered—a plain tribute to the excellency of their design and material. Our productive capacity for 1907 will be so enlarged as to avoid the disappointment of fruitless inquiry.

MOTOR WAGON PARTS

We can, however, promptly execute orders for steering gears, brakes, sprockets, motor hangers and other parts for motor wagons. They are suitable for all classes of commercial power vehicles, from the lightest to the heaviest. They are not "freak" components of a wonder working vehicle. They enjoy the rare distinction of having been thoroughly tested for some years past in the most varied and severe kinds of commercial service. Circulars 2, 3, 5, 10 and 11 give information concerning them.

Pinion and Section
Type also supplied.**THE GARFORD COMPANY, Elyria, O.**

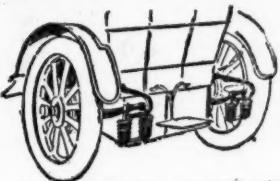
Sales Manager: HAYDEN EAMES, Cleveland, O.

**BUMPING
THE BUMPS**

in a Motor Car is bad enough in the summer time when the ground is soft, but when winter rolls around and the roads freeze up, you simply MUST do something to offset the jolts and jars of driving.

**SUPPLEMENTARY
SPIRAL
SPRINGS**

Absolutely do Absorb
all Vibration



If Comfort Interests You, You Will Find Them

A NECESSITY

They act alike under heavy and light loads. They save your engine, your tires, your car and your back.

When you write for Catalogue, mention name and model of your car.
Address

SUPPLEMENTARY SPIRAL SPRING CO.,
4527 Delmar Avenue :: :: ST. LOUIS, MO.

**Swinehart Tires**

One proof that our tire is superior to any, is the fact that dealers are pushing our tires although we do not allow them as great a commission on sales as they get on other tires; neither do they ever expect any revenue for repairs after our tires are applied.

We have hundreds of testimonials from users of Swinehart tires on sixty different types of cars, claiming that Swinehart tires do not injure their machinery. This proves either that our tires are superior to other solid tires or that there are plenty of substantially built ears now on the market.

The Swinehart Clincher Tire & Rubber Co.

AKRON, OHIO

New York City, 1773 Broadway Chicago, 1208 Michigan Boulevard

HAVE YOU SEEN THE NEW

KOKOMO

MECHANICALLY - ATTACHED

AUTOMOBILE TIRE?
It is just what you have been
looking for.

Quickly attached and detached.
Creeping and Rim Cutting entirely avoided.
Made of the very best material and workmanship
throughout.
Write us for full particulars.

KOKOMO RUBBER CO.,
KOKOMO, IND.



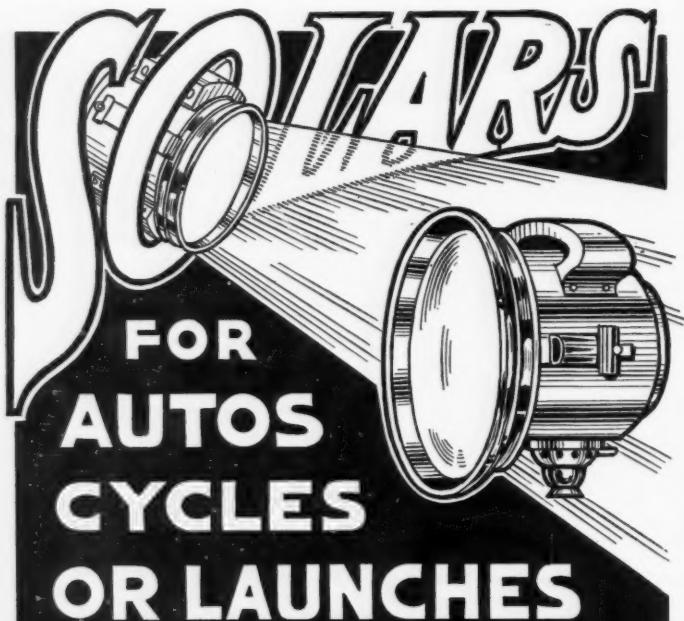
Self-Starting from the Seat
(With Make and Break Ignition)

"Matheson"

"America's Finest Motor Car"
1906 Models { 40-45 H. P.
60-65 H. P.

Our New Factory now building, in.... **WILKES-BARRE, PA.**
will be one of the largest and most modern automobile plants in existence. We will
move into this new plant about January 1, 1906. Address until then.....

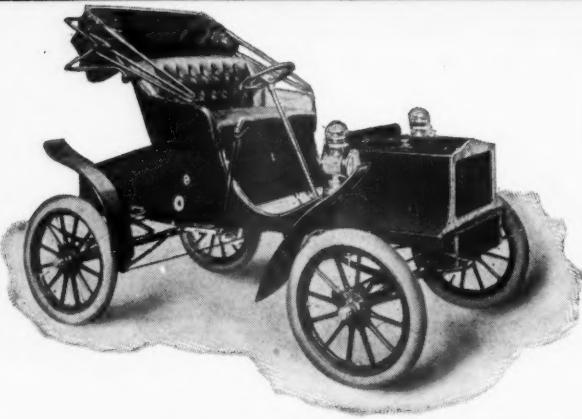
MATHESON MOTOR CAR CO.
Holyoke, Mass.



MR. DEALER: Why not handle a line that you know will satisfy your customers instead of taking chances on "just as good" lamps. YOUR profit is as MUCH or MORE on Solars, and your customers "stick." Write us to-day for prices on our 1906 line.

BADGER BRASS MFG. CO.
New York Office, 11 Warren St. KENOSHA, WIS.

GALE



1906
Model "D" **\$650** Minus Top
\$600

WHEEL-POST CONTROL, ROLLER BEARINGS to rear axle
ANY TIRES, 28x3, Pneumatic, Solid or any other kind
Equipment includes Lamps and Horn

OUR 1906 LINE in addition to Model D, will consist of
two other models yet to be announced

Dealers who know the value of handling a GOOD
CAR at a LOW PRICE will write us at
once regarding 1906 agencies

WESTERN TOOL WORKS GALESBURG
ILLINOIS

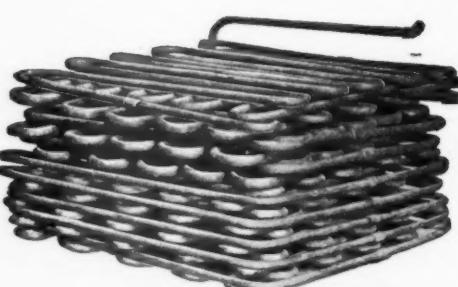
STEAM CAR SPECIALTIES

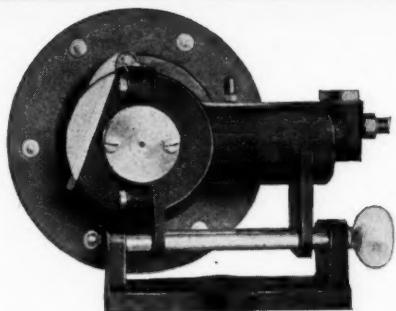
STRICTLY UP-TO-DATE

The only Flash Boiler with a reserve capacity. Condensers that condense. Burners that burn: either kerosene or gasoline. Single Acting Steam Engines, designed especially for superheated steam.

Everything for building an up-to-date steam car, or for remodeling your old one. Flash Boilers; any size.

E. C. Walker Co.
1913-1923 LOGAN ST., LOUISVILLE, KY.





The P. T. C. Power Tire Pump

It is designed to inflate pneumatic tires by POWER driven by friction from fly wheel. Always in place. Started by turning a screw. Write for circular.

The Pacific Tucking & Manufacturing Co.

471-3 18th Street, BROOKLYN N. Y.

WE HAVE IT

**Absolutely
Tested**
by all kinds
of Herculean
Work

**Positively
Proved**
by six months
of faultless
performance



Cylinders surrounded by Hood with Fan connection on outer end, blowing a
CONTINUOUS HURRICANE OF COLD AIR AROUND AND OVER TOP OF CYLINDERS
Write for Descriptive Particulars

TREBERT

THE DETAILS

15 H. P., developed at 1500 revolutions.
Bore and stroke, 3 $\frac{1}{2}$ inches.
Length of Motor over all, 29 inches.
Crank Shaft diameter, 1 $\frac{1}{4}$ inches.
Total bearing surface on Crank Shaft, 10 $\frac{1}{4}$ inches.
Bearing on Connecting Rods, 2 $\frac{1}{4}$ inches.
Bearing on Wrist Pin, 1 $\frac{1}{4}$ x 1 $\frac{1}{4}$ inches.
Connecting Rods of drop forgings with phosphor bronze
Crank Shaft.

Base and Crank Case of Aluminum.
Width of Motor from end of arm to end of arm, 19 $\frac{1}{2}$ inches.
Center of Crank Shaft to bottom of Motor, 4 $\frac{1}{2}$ inches.
Center of Crank Shaft to top of Motor, 18 inches.
Total Height of Motor from bottom of Crank Case to top of Exhaust Pipe, 22 inches.
Total Weight, 225 lbs.
Lubrication by Splash Feed and constant level automatic lubricator.

TREBERT GAS ENGINE CO

BOTH AIR AND WATER-COOLED MOTORS FOR MARINE AND AUTOMOBILE PURPOSES
BUILDERS OF TRANSMISSIONS AND CLUTCHES :::: LIGHT POWERED CARS REBUILT

REFERENCE: JOHN WANAMAKER, NEW YORK
180 WEST MAIN STREET, ROCHESTER, N. Y.

BERKSHIRE AUTOMOBILES
High Class Touring Cars
Made and Tested in the Berkshire Hills

1906 Models Ready December 15th.

16 H. P. \$2,000. 25 H. P. \$2,500. 40 H. P. \$4,500.

Douglas Andrews Company,

SELLING AGENTS.

1623 BROADWAY, NEW YORK.



BROWN-LIPE GEARS

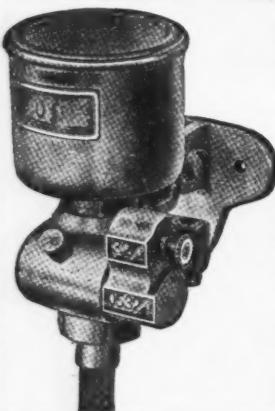
IRREVERSIBLE STEERING
BEVEL AND CHAIN DRIVE DIFFERENTIAL
MANY SIZES AND MODELS
SLIDING GEAR TRANSMISSION



K. FRANKLIN PETERSON, 166 Lake St., Chicago.
THOS. J. WETZEL, 11 Warren St., New York.
CHAS. E. MILLER, 97 Beade St., New York.
318-320 No. Broad St., Philadelphia.
202-4 Columbus Ave., Boston.
408 Erie St., Cleveland, O.
POST & LESTER Co., Hartford, Conn., Eastern Sales Agts.

{ Direct Factory Salesmen.
Sales Agent Carrying Stock.

BROWN-LIPE GEAR CO.
200 South Geddes Street SYRACUSE, N. Y.



Start the New Year Right With the **AUTO-METER**

"It Tells How Fast"

ON YOUR DASHBOARD

"It Tells How Far"

If you want to know with absolute certainty just what your car is doing in the way of speed at any time, the Auto-Meter's Speed Dial will tell you. If you want to know with absolute certainty just how far your car has traveled on a trip, the Auto-Meter's Trip Dial will inform you. If you want to know with absolute certainty just how far your car has traveled after the season is over, the Auto-Meter's Season Dial will show you. Automobiling is not enjoyed to the fullest, until there's an Auto-Meter on the car.

Write for Catalogue and "Indisputable Evidence"

Warner Instrument Company

55 Roosevelt Avenue
Beloit, Wis.

NEW YORK OFFICE: 1691 Broadway BOSTON OFFICE: 143 Federal Street CHICAGO OFFICE: 804 Steinway Hall
NORTHERN CALIFORNIA: G. P. Moore & Co., San Francisco SOUTHERN CALIFORNIA: Heineman & Pearson, Los Angeles

THE COIL THAT DOES THE TRICK

In the Climb to the Clouds

Chas. Soules, driving a Pope-Toledo fully equipped Touring Car, made the ascent in 29:37 2-5. This is considered a most wonderful performance. Besides

SPLITDORF COILS

were winners in nearly every event. Ask the Glidden Tourists how they like the Splitdorf Coil. Seventy-five per cent of the cars on the tour were equipped with them.

HERE IS DR. PARKER'S LETTER:

Mrs. C. F. SPLITDORF. June 24th, 1905.
Dear Sir: I feel that in the recent 200 mile contest my success, in a large degree, was due to your coil. It seems to me that your latest is superior to anything in use to date. I tell my automobile friends to give me a SPLITDORF for reliability every time. Very truly, C. B. PARKER.
167 Remsen St., Brooklyn, N. Y.

Winner of Recent Economy Test of Long Island Automobile Club

C. F. SPLITDORF 17-27 Vandewater St.
NEW YORK CITY

The Largest and Most Successful Coil Maker in the World.

G E E C E E = STORAGE BATTERY =

UNEQUALED FOR

Automobile and
Motor Boat

Ignition and
Illumination

HIGHER IN CAPACITY AND
VOLTAGE THAN ANY WET
BATTERY NOW ON THE
MARKET.

Acid (Electrolyte) in suspended form, made dry by a secret process, can't spill or leak. Perfectly safe in any position. No danger of acid-eaten clothes, connections, etc.

As easily recharged as a wet battery. A layman can do it as well as an electrician when he uses the "Geecee" charging outfit.

Full directions with each Battery and outfit.

By buying the "Geecee" you buy miles, and you will know just how far you can go.

The same battery that operates your ignition outfit will also furnish the required current to operate your limousine light or a search light on your motor boat.

Royal Battery Co., Mfrs. 143 CHAMBERS ST.
NEW YORK

NATIONAL SALES CORPORATION
FACTORY SALES MANAGERS

236 Broadway : : : NEW YORK

SCHRADER UNIVERSAL VALVE

Trade Mark Registered April 30, 1895

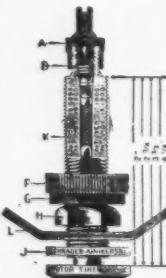
SIMPLE AND ABSOLUTELY AIR TIGHT

Schrader Motor Tire Valves, as shown in cut, are the regular equipment for G & J Motor Tires; our No. 777 Valve being the standard for 2 1-2 inch and 3 inch tires, and our No. 725 Motor Valve being the standard for all tires larger than 3 inch.

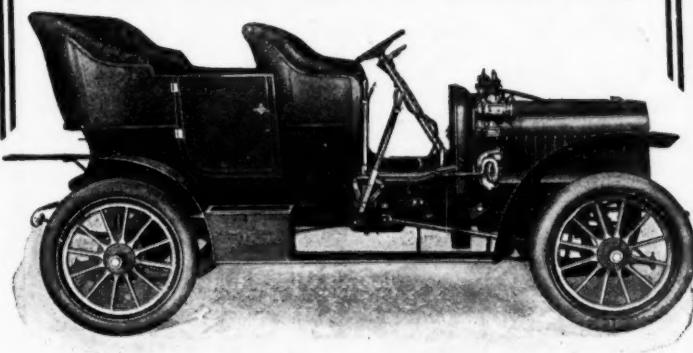
SUPPLIED TO THE TRADE BY ALL TIRE MANUFACTURERS

Manufactured by

A. SCHRADER'S SON, Inc., 28-30-32 Rose Street, New York



MOLINE



18-20 H.P. Model "C" \$1,750

The smartest little four cylinder car in the market at the price.

Other styles for 1906 are—

Model "A" 30-35 H. P. \$2500.00

Same general type as Model "C" only larger and more luxurious.

Model "C" 16 H. P. \$1000.00

A most decidedly attractive double cylinder car for four or five passengers.

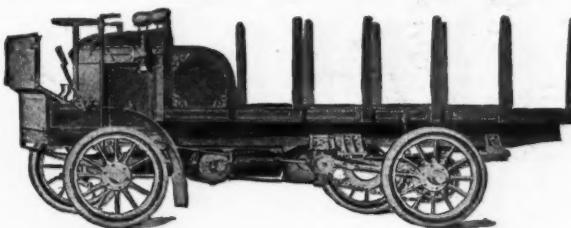
Full particulars of all three styles may be had by writing to us.

Moline Automobile Company, East Moline, Ill.

NEW YORK,
Automobile Exchange and Storage Co.,
133-139 West 38th St.

BOSTON,
C. H. Saunders,
"Motor Mart."

KNOX



NEW MODEL STAKE TRUCK

Developed along the sound lines of construction that have built up for us the largest Gasoline Commercial Car Business in the country.

POWERFUL RELIABLE ECONOMICAL

CARRYING CAPACITY, 6,000 LBS.

Cylinders Air Cooled Speed 12 Miles Per Hour

Chassis is adapted to bodies of various styles

Every firm using trucks of large capacity should investigate this new model. It is one of the finest products of our many years' experience in building cars for "All the Year Round" service. Write for particulars as to Waterless Knox D-4 Stake Truck.

Agents in All Principal Cities.

KNOX AUTOMOBILE CO., Springfield, Mass.

Largest and Oldest Manufacturers of Gasoline Commercial Cars.

We Exhibit in New York at Madison Square Garden Only, Jan. 13-20, 1906

MEMBERS A. L. A. M.

Automobile Lamp Manufacturers

WHO USE

Licensed Burners Only

Atwood Manufacturing Co., Amesbury, Mass.
Badger Brass Mfg. Co. (Solar), Kenosha, Wis.

Commercial Acetylene Co., New York City, N. Y.

R. E. Dietz Co., New York City, N. Y.

A. H. Funke, New York City, N. Y.

Gray & Davis, Amesbury, Mass.

Manhattan Lamp Works, New York City, N. Y.

Motor Car Equipment Co., New York City, N. Y.

New York Coach & Auto Lamp Co., New York City, N. Y.

Rose Mfg. Co., Philadelphia, Pa.

Scoville & Peck Co., New Haven, Conn.

Also all Auto Supply Houses.

The Von Schwarz Burners are, with the exception of the Crescents, the only licensed burners.

Von Schwarz Burners

On Label: Von Schwarz and patent number.

On Steatite: J. v. S.

On Pillar: J. v. S. &

'M. K. & Co.
Pat. Aug. 31, '97.



It is easy to avoid trouble—simply insist upon licensed burners.



BRENNAN MOTORS SATISFY

NOTHING CAN DO MORE

We make a special motor and transmission gear for

OLDSMOBILES

NORTHERN

Runabouts

OLDS

TOUR-

ING

CARS

CADILLAC

FORD

THOMAS

Models 17 and 18

GENERAL

YALE

AUTOCAR

WHITE STEAM CAR GLIDE RAMBLER CLEVELAND

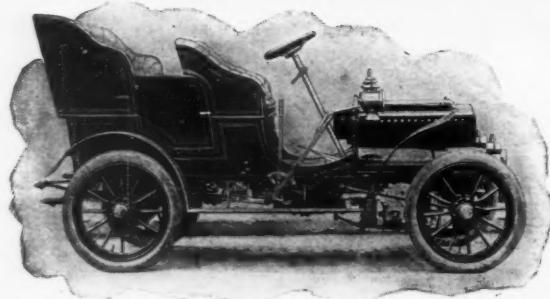
POPE-HARTFORD SANDUSKY RUNABOUT

ST. LOUIS RUNABOUT MARR CAR GROUT STEAM CAR

and all standard makes of cars

BRENNAN MFG. CO. SYRACUSE N. Y.





Wolverine D

Double-opposed Motor
Under the Hood
Bevel Gear Drive
3-speed Sliding Gear
Transmission
18 Horsepower (Actual)

Price, \$1,250.00

Wolverine Automobile and Commercial
Vehicle Company

Dept. "C." Dundee, Mich.

PITTSFIELD

The Pittsfield Line consists of Coils, Commutators, Switches and Spark Plugs.

WE CLAIM them to be, BAR NONE, the best in every particular in the world.

WE KNOW that they are perfect in economy, reliability, rapidity and insulation.

THE PERFECT INSULATION on the Pittsfield Coil, absolutely makes puncturing or rupturing an impossibility.

OUR 1906 COMMUTATOR or Timer is guaranteed a positive contact under any and all conditions.

OUR 1906 JEWEL SPARK PLUG prevents fouling or short circuiting. Sparking points and chamber between core and shell are thoroughly cleaned at each explosion.

WRITE FOR BOOKLET explaining every point. It covers the subject of IGNITION completely. Address

PITTSFIELD SPARK PLUG CO.

Pittsfield, Mass.

Excelsior Supply Co., Randolph Street, Chicago, Western Distributors.

PERFECTION

When Writing to Advertisers, Please Mention Motor Age.

PREST-O-LITE GAS TANK

No Waste.
No Odor.
No Attention. Tips
Never Clog.
Nothing to
Freeze.



SIMPLE
ENOUGH
When you want
gas, turn it on.
When you don't,
turn it off.

NEVER AFFECTED BY EXTREME COLD

In cold weather moisture collects in the tubes leading from the Generator to the Lamps, causing them frequently to freeze up; either entirely preventing gas from passing to the lamps or bursts the pipes.

The gas from the Prest-O-Lite Gas Tank contains nothing to freeze. It simply cannot freeze.

ALWAYS READY FOR SERVICE

No time lost No inconvenience Write for booklet

PREST-O-LITE CO., - Indianapolis, Ind.

Exclusive Licensees under patents of the Commercial Acetylene Co.
AGENTS IN MOST CITIES. :: :: WE WANT THEM IN ALL

8,000 MILES

Perfect Satisfaction,
Never Breaking

HOTEL TOURNAINE
BOSTON

July 3d, 1905.

BRAMPTON BROS., Ltd.,

Dear Sirs—It is a pleasure for me to say that the chains made by you and used on the world's tour have given perfect satisfaction, never breaking. They have carried us over New Zealand's mountains, the bad roads of Australia, and through many countries. The set sent you herewith has been used for 8,000 miles.

Very truly yours, (Signed) CHAS. J. GLIDDEN.

Weight of car, baggage and passengers, 4200 lbs.

1906 CARS

Do you want this kind of chain on your 1906 car? You can have it if you ask the manufacturer to fit the Brampton chain to your car and with no extra expense to you or the manufacturer. All standard sizes in stock to fit American and Foreign cars.

Catalogue mailed on request.

CHARLES E. MILLER

Manufacturer, Jobber,
Exporter and Importer

Home Office, 97-99-101 Reade St., New York City

BROADWAY AND 38TH ST., NEW YORK. PHILADELPHIA—318-320 N. BROAD ST.
BOSTON, MASS.—202-204 COLUMBUS AV. CLEVELAND, O.—408 ERIE ST.

GAS-AU-LEC

"THE SIMPLE
CAR"



Elegant in Finish

Luxurious in Appointments

Built by Skilled Workmen from the Best
Materials Obtainable

THE SIMPLEST GASOLENE CAR IN THE WORLD

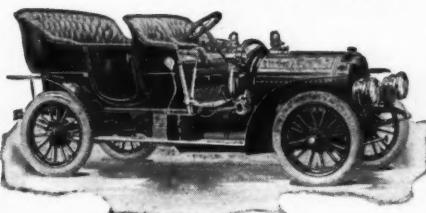
—both as to construction and control, and the easiest to operate and maintain.

"Marks a New Era in Automobile Construction"

40-45 Horse Power, \$5,000

CORWIN MANUFACTURING COMPANY
PEABODY, MASS., U. S. A.

What Royal Tourist Owners are Writin'



"More pleased with Royal than any car I have ever owned. Have owned about 25, both foreign and American."

"Mine has run about 4900 miles this season, and has had absolutely no repairs."

"Since June 22d I have toured about 6000 miles and during this time I have never once stopped on the road to make a single repair or adjustment."

"The Royal Tourist which I purchased of you has run about 6000 miles, over hard country roads and sharp hills, and total cost of repairs will not exceed \$3.00."

"I have run this car about 6000 miles and have given it some hard usage. The expense for repairs has been \$3.25."

"Am delighted with my Royal. Have run it nearly 2000 miles and have had no repairs."

"We have been over 7500 miles at this date, without a repair or replacement of any kind or description, except to tires."

Ask any of our Agents to show you reproductions of letters from which these remarks were taken.

ROYAL

THE ROYAL MOTOR CAR CO.
CLEVELAND, OHIO

AGENTS

C. A. Duerr & Co., New York, N. Y.; G. J. Dunham, Boston, Mass.; The McDuffee Automobile Co., Chicago, Ill.; G. W. Caplin, Minneapolis, Minn.; Automobile & Supply Co., Lim., Toronto, Ont.; Motor Shop, Philadelphia, Pa.; Westminster Automobile Co., St. Louis, Mo.; Standard Automobile Co., Pittsburgh, Pa.; Amos-Pierce & Co., Syracuse, N. Y.; Thompson Schoeffel Co., Rochester, N. Y.; Gus Boyer, San Francisco, Cal. Member A. L. A. M. Send for Catalogue.

Hotel Marlborough

Broadway, 36th and 37th Sts.
Herald Square :: New York

MOST CENTRALLY LOCATED HOTEL ON BROADWAY

Under New Management Since January, 1905

Completely Renovated and Transformed in Every Department

*The Largest and Most Attractive Lobby and Rotunda
in the City*

Two Beautiful New Dining Rooms

Superior Table d'Hote Dinner every day from 6 to 9 p. m.

The Famous German RathsKeller

Broadway's Chief Attraction for Special Food Dishes

Popular Music

Better than ever before

400 Rooms European Plan 200 Baths

HEADQUARTERS FOR AUTOMOBILISTS

Make Reservation for Rooms Early

RATES FOR ROOMS: \$1.50 and upward; \$2.00 and upward with bath. Parlor bedroom and bath, \$3.00, \$4.00 and \$5.00 per day. Parlor, two bedrooms and bath, \$5.00, \$6.00 and \$8.00 per day, \$1.00 extra where two persons occupy a single room

Write for Booklet

Sweeney-Tierney Hotel Company
E. M. TIERNEY, Manager

Carpenter Nickel=Chrome Steels.



Crankshafts and Axles forged only in Slab Form, slotted and finished to size; then oil treated in our Projectile Department. Shafts and Axles thus made of our No. 1 AUTONICKEL—CHROME-STEEL average:

Tensile Strength,	130,000 lbs.
Elastic Limit,	114,000 lbs.
Elongation	19 per cent
Reduction of Area	60 per cent

SPECIAL ALLOYED STEELS

FOR

GEARS, SPRINGS, VALVES, FORGINGS, ETC.

THE CARPENTER STEEL COMPANY

Works: Reading, Pa.

New York Office: 1 Broadway.

The Wray Compound Air Pump

with pressure register, price complete, \$6.00

Inflate your tires to the following pressure:

4 1-2 in. Tires	3 1-2 in. Tires
Ft Re	Ft. Re
60 lb. 75 lb.	70 lb. 80 lb.

4 in. Tires	3 in. Tires
Ft. Re	Ft. Re
60 lb. 75 lb.	60 lb. 70 lb.

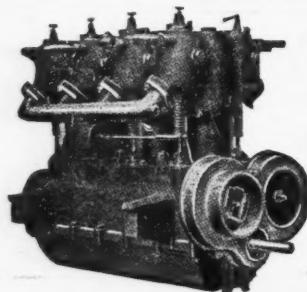
Wray Pump & Register Co.

191-193 Mill St.,
ROCHESTER, N. Y.

Send for complete catalog.



Patent Allowed

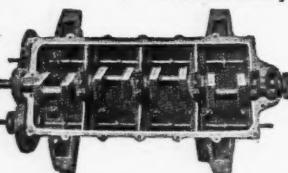


Gas, Gasoline and Kerosene
ASTER CO.,
Office, 1591 Broadway, New York

"Aster" Motors

From 1 to 60 H. P.

Automobile Motors
Marine Motors
Electric Groups
Stationary



Veeder ODOMETERS

For \$10.00 you can get the Form B Veeder Odometer which goes on the left steering arm, and for \$25.00 you can get the Form D, which goes on the dash. The latter type has two registers, one of which may be set to zero at will.

"It's Nice to Know
How Far You Go."

THE VEEDER MFG. CO., 25 Sargeant St., Hartford, Conn.
Cyclometers, Odometers, Tachometers, Counters and Fine Castings.

LATEST TYPE WILLARD LATEST TYPE STORAGE BATTERIES

Are operating Electric Automobiles Regularly

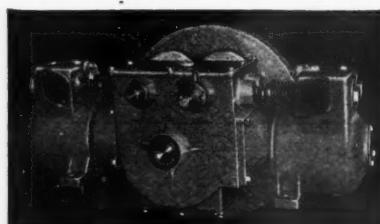
75 MILES AND OVER ON ONE CHARGE

Write for Particulars

The Willard Storage Battery Company
Cleveland, Ohio

25 H. P. Vertical 16 H. P. Opposed

High-Class Automobile Motors



The
A. Streit
Machine
Co.

CINCINNATI
OHIO

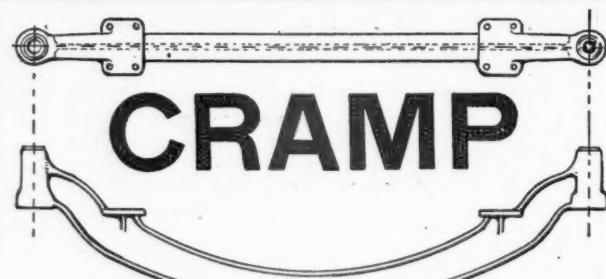
STOP THAT NOISE!

NEW PROCESS PINIONS

Will stop the racket made by your Time Gears, Pump Drive Gears or Igniter Gears, and will outwear all other kinds of Noiseless Pinions.

LET US HEAR FROM YOU.

THE NEW PROCESS RAW HIDE CO.
SYRACUSE, NEW YORK



The Winton Front Axle Casting of Parsons' Manganese Bronze
Fifty thousand pounds of Ingots furnished for the 1906 Cars.
The William Cramp & Sons & Ship Engine Building Company
PHILADELPHIA, PENNA.

There's Danger in the Dark

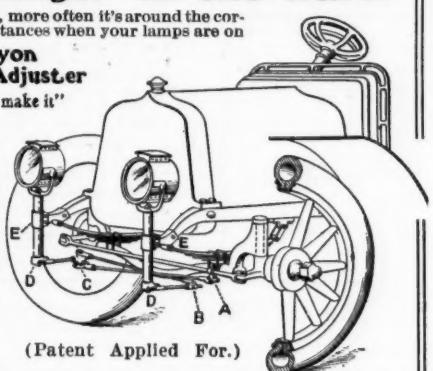
Sometimes it's straightaway, more often it's around the corners. Laid bare in both instances when your lamps are on

The Imperial-Lyon Automatic Lamp Adjuster

"It lights a turn before you make it"

Fits any make of car, carries any make of lamp. Makes the lights move with wheels. Gives you a light around the corner before your car makes the turn. A safeguard against collisions and smashups, in fact a necessity, if you ride after dark. Get a circular and get acquainted with it. Send us your name and address and we'll send circular and price.

Imperial Brass Mfg. Co.
249 S. Jefferson St. Chicago



(Patent Applied For.)

The Standard American Cooler

THE WHITLOCK COOLER

Was used on the LOCOMOBILE RACER THAT FINISHED THIRD IN THE VANDERBILT CUP RACE. It was never touched during the race. IT DID ITS FULL duty. It held its water and kept the engine cool.

The Only Cellular Coolers Made in America

that were used in the 1905 and 1906 Vanderbilt Cup Racers, also the 1906 Gordon Bennett Race. Quality and efficiency only figure in an event of this importance. We make coolers of the HIGH&ST EFFICIENCY. The leading makers of automobiles have recognized this fact by adopting

THE WHITLOCK COOLERS

continuously for the seasons of 1903, 1904, 1905 and 1906.

THE WHITLOCK COIL PIPE CO.

Hartford, Conn.

STOLP COOLERS

GOOD COOLERS



Stolp Mfg. Co.
CHICAGO

Patents Pending

MUD GUARDS

HOODS AND FORGED IRONS

"The Best Kind"

HAYES MFG. CO.

750 Bellevue Ave. Detroit, Mich.

Baldwin Automobile Chains and Sprockets

Best Material

Accurate Construction



SEND FOR CATALOGUE



BALDWIN CHAIN & MFG. CO. WORCESTER MASS.

K. Franklin Peterson, Western Sales Agent
166 Lake Street, Chicago, Ill.

ARTILLERY WHEELS



Made from thoroughly seasoned hickory timber. Having the largest and best equipped Automobile wheel plant in the United States, we are prepared to supply manufacturers in quantity in the shortest possible time.

Write for particulars and our price lists.

BUCKEYE WHEEL CO., Galion, Ohio

A Swell Joint



The acme of specialization—the limit of excellence—is represented in our

Universal

Joint and Brake Drum

Your closest investigation of our claims will PROVE that NOTHING BUT THE BEST in EVERY RESPECT is used. Write us TO-DAY.

SPICER UNIVERSAL JOINT MFG. CO.
PLAINFIELD, N. J.

Direct factory representatives: K. Franklin Peterson, 166 Lake Street, Chicago; Thos. J. Wetzel, 11 Warren Street, New York.

Anti-Freezing Calcium Chloride

In cooling water of Automobiles **Won't Rust** or effect the metal. Freezing point 54° below zero. Non-precipitating.

Write For Our Circular

James H. Rhodes & Company,
107 E. Kinzie St., Chicago.

GRAY & DAVIS
HIGH GRADE LAMPS
AMESBURY, MASS.

Standard Roller Bearing Co.

STEEL BALLS
BALL BEARINGS
Roller Bearings
Automobile Axles

Send for Catalogue. PHILADELPHIA



JUMP SPARK COILS

For all Purposes—Single, double, triple and quadruple, for stationary engines and automobiles. Guaranteed in every particular. Fine Vibrator.

Send for Catalogue K.

THE KNOBLOCK-HEIDEMAN MFG. CO., South Bend, Ind.

ALUMINUM CASTINGS

Grade
GUARANTEED
MAXIMUM
STRENGTH
Screw
bolts for
steam cylinder.
VERY TOUGH AND HARD.

8 Bearing metal for bearings, thrust rings, slide valves, cross head jibs, piston rings, etc.

VERY HARD AND DURABLE,

but cannot cut the journal.

In ordering Phosphor Bronze Castings note adaptation of the qualities above given.

GUARANTEED
MINIMUM
WEIGHT

Light Mfg. & Foundry Co., POTTSSTOWN, PENNSYLVANIA

C. O. T. ACID CURE SOLUTION AND VULCANIZING FLUID.

WHY worry over a puncture when C. O. T. Acid Cure Solution will stick a patch while you sleep, and fill up a cut in your auto shoe by using it to join a piece of rubber size of cut. Not loosened by heat. Plain rubber patches both round and oblong.

CHAS. O. TINGLEY & COMPANY, Rahway, N. J. Beckley-Ralston Co., Chicago, Ill. West. Dis. Phoenix Auto Supply Co., St. Louis, Mo. A. L. Dyke, Mgr., Southwestern Agents.



We make Tops and Cushions and re-trim Automobiles throughout. Also do Painting of the highest class. Prices reasonable for fine work. There is economy and satisfaction in having such work done outside of the city.

W. S. FRAZIER & CO., Aurora, Ill.
Chicago Office, 371 Wabash Ave.

Electric Signs

Made any way at least expense, shipped anywhere. Why not have a "Garage" or "Auto Inn" sign over your door. Your front is your best advertisement. Send for price list.

U. S. ELECTRIC SIGN CO., Muncie, Ind.

DUST-DEFLECTORS

MAKE MOTORING AS DUSTLESS AS SAILING

\$20 Brings relief from dust for the rest of your life.
BOOKLET TO INQUIRERS.

W. H. BROWN, Lenox Bldg., Cleveland, O.

SPRINGFIELD TOPS

3, 4, and 5 Bow
Aluminum Bodies
Springfield
Metal Body Co
72 Birne Ave.
Brightwood
SPRINGFIELD,
MASS.



"MOTOR AGE" and "MOTOR," \$3.00 Per Year

Send Subscriptions to 309 Michigan Ave., Chicago.

MOTORS—All Commercial Sizes

CONTINENTAL ENGINE

NEW OFFICE AND FACTORY

Cor. Kingsbury & Huron Sts., Chicago, Ill.

1½-40 h. p. 2 and 4 cycle

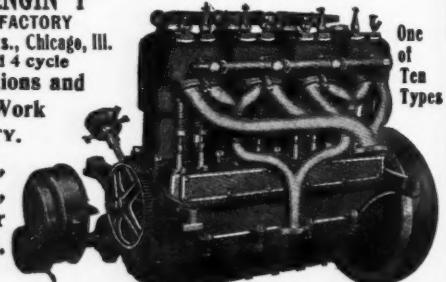
Designs, Specifications and

Special Contract Work

OUR SPECIALTY.

4-Cyl. air cooled,
weight 90 lbs.,
total. 3-Cyl. air
cooled, 75 lbs.
total.

Telephone North 1607



VERTICAL AND HORIZONTAL

Chicago and Cincinnati

are connected by a railroad route having finely appointed trains, day and night—Sleepers and Parlors.

Monon—C. H. & D.

Ride this way once and you'll ride again—we think.

CHAS. H. ROCKWELL, TRAFFIC MANAGER, CHICAGO FRANK J. REED, GEN. PASS. AGT.



"Exide" SPARKING CELLS

THE ELECTRIC STORAGE BATTERY CO. PHILADELPHIA, Pa.

Philadelphia, 250 North Broad St.
New York, 49th St. and 8th Ave.
San Francisco, 635 Howard St.
Pasadena, 33 South Raymond Ave.

SALES OFFICES:—New York, Boston, Chicago, St. Louis, Cleveland, San Francisco, Toronto, Canada.

These cells have been designed and assembled with great care, especial attention having been given to each detail, making them a practical ignition cell for gasoline engines in Automobiles and Auto Boats.

DEPOTS FOR THE PROMPT DELIVERY AND CARE OF EXIDE BATTERIES:
Minneapolis, 3d Ave. So. & 5th St.
St. Paul, 372 Minnesota St.
Pittsburgh, 5905 Centre Ave.
Rochester, 150 South Ave.

Portland, Ore., 140 5th St., N.
Cleveland, 404 Huron St.
Detroit, 265 Jefferson Ave.
Chicago, 204 East Lake St.

Los Angeles, 334 S. Main St.
Buffalo, 648 Main St.
Boston, 39 Stanhope St.
Savannah, 309 Bull St.
St. Louis, 3944 Olive St.
Denver, 1449 Clarkson St.
Toronto, Canada.



Strength, Safety, Simplicity in the Springfield JACK and TIRE TOOL

For any car weighing from 500 to 4000 pounds.
Price \$2.25 delivered.

For removing any Clincher Tire from 2½ to 4½ inches.
Price \$2 delivered.

Sold by all dealers.

THE SHAWVER COMPANY
Springfield, Ohio

WHAT YOU WANT—WHEN YOU WANT IT

SYRACUSE ALUMINUM AND BRONZE COMPANY
SYRACUSE, N. Y.

ALUMINUM CASTINGS BRONZE

FOR AUTOMOBILE

USED BY
THE LARGEST
MANUFACTURERS

HARRIS OIL

Sold at all Principal Garages

A. W. HARRIS OIL CO.
330 South Water St., Providence, R. I.
and
56 Fifth Ave., Chicago

LUBRICATION

"SOLDERENE"

A new rapid flux and tin combined for mending and soldering all metals without the use of the solder, soldering iron, acids, etc., by simply heating the article and applying Solderene. A stick should be in every Repair Kit.

Sample 10c. Dealers Write for Price.
CHAS. A. THOMPSON CO.
39 Cortlandt Street New York City



The Oliver
Typewriter
Co.,

100-200 WABASH AVE.,
CHICAGO, ILL., U. S. A.

Foreign Office
75 Queen Victoria St.,
London, England.

MAT'S BODY POLISH

Prevents the Finish from Cracking or Staining

Used by the Chicago Garages. Send for sample.

**\$2 PER
GAL.** MAT. WEIS
1412 Michigan Avenue, CHICAGO

Keep Your Feet Warm

and you will be warm all over.

The H. & H. Auto Heater

Does the Trick Right.

No fuel. No smell. Just pure air. Get our Catalogue. Address
Chicago Auto Heater Co., 285 N. State St., Chicago

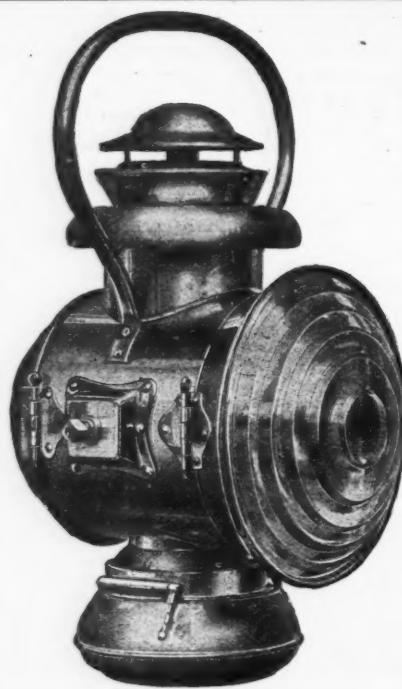


THE WHITNEY MFG. CO., Hartford, Conn.

"Whitney" Chains

PATENTED

USED BY THE LEADERS



RELIABLE GUIDES are the HAM LAMPS

The TOURIST for 1906

is the greatest light-producing oil lamp ever made.

SEE THE LENS?

If your car is equipped with TOURIST Lamps, you don't stop when the acetylene lamps fail you, as the way will still be lighted with reliable light. Light that won't blow out or jar out.

You can save yourself from lamp troubles by insisting that your car is equipped with HAM Lamps.

Write for booklet showing complete line.

C. T. HAM MFG. CO. Rochester, New York



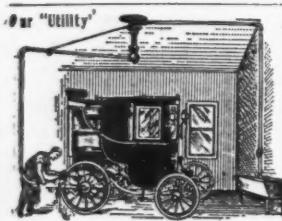
Voltage—4, 6 and 8
Capacity—
20 Amp.—Hours
Prices—\$6, \$9, \$12
Other styles—
\$3.25 to \$32.00.
Established 1889.
Catalogues on
Request.

AMERICAN BATTERY COMPANY
165 South Clinton St. CHICAGO, ILL.



A high class Coupé Top. Fits Olds Standard Runabout, can be attached in thirty minutes and detached in ten minutes. Front glass hinged and can be raised at will. Price, \$60.00. Write for full description.

The Fellwock Autotop Co., Evansville, Ind.



Overhead Washing Machines

A Time, Labor and Money Saver.
For Public and Private Garages. No garage is complete without them.
Send for descriptive pamphlet and prices.

A NECESSITY TO EVERY AUTOMOBILE OWNER
THE H. NICHOLSBURG MFG. CO., 68 Dey Street, NEW YORK

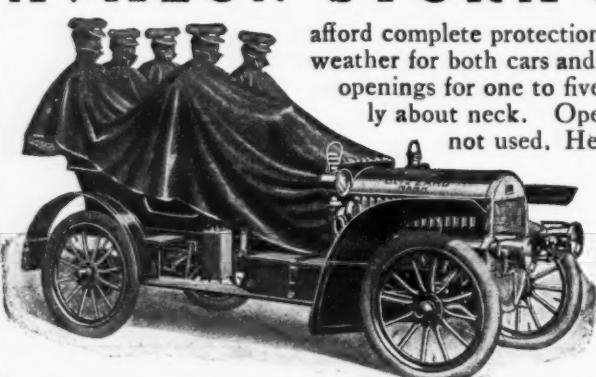


AUTOMOBILE RUNNING GEARS WE BUILD ALL STYLES

With Pressed Steel or Angle Iron Frames and with Chain or Gear Drive; also all kinds of Bodies and Parts

H. F. BORBEIN & CO. 2109 N. 9th Street, ST. LOUIS, MO

AVALON STORM APRONS



afford complete protection against storms and bad weather for both cars and occupants. Made with openings for one to five persons. Fasten closely about neck. Openings can be closed if not used. Heavy rubber cloth,—plaid back. We also handle

WEED CHAIN TIRE GRIPS

Prevent skidding and assist in traction on muddy roads.

Write for *Special Deal*
prices on above.

The Ball-Fintze Co.
Dept. C. Newark, Ohio



SPROCKETS

Chains and Differentials

CULLMAN WHEEL CO.

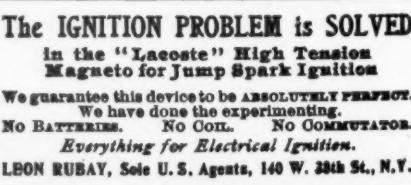
1021 DUNNING STREET, CHICAGO, ILL.



DIXON'S GRAPHITE
Motor Lubricants
Interesting booklet
and samples FREE.
Joseph Dixon Crucible Co.
Jersey City, N. J.



MOTOR CAR SPECIALTIES
and SUNDRIES
WE SELL EVERYTHING
WRITE FOR CATALOG
THE AUTOMOBILE EQUIPMENT CO.
252 Jefferson Ave. Detroit, Mich



The IGNITION PROBLEM is SOLVED
in the "Lacoste" High Tension Magneto for Jump Spark Ignition
We guarantee this device to be ABSOLUTELY PERFECT.
We have done the experimenting.
No BATTERIES. No COIL. No COMMUTATOR.
Everything for Electrical Ignition.
LEON RUBAY, Sole U. S. Agents, 140 W. 38th St., N. Y.

TOOLS

for producing
duplicate
Metal Parts

I would like to do your tool work, either wholly or in part. It is my business to make tools. Facilities for doing this work are first-class and every effort will be made to give satisfactory service.

L. T. GAUSS, 222 Mill St., Rochester, N. Y.

DIES for blanking,
forming and drawing
DRILL JIGS
MILLING FIXTURES
VISE JAWS
SPECIAL CUTTERS, ETC.



Special Design—Finest Quality—Built-to-Order
BODIES AND TOPS
C. P. KIMBALL & CO.
315 Michigan Ave. Chicago

"E. & J." LAMPS
GAS AND OIL SIDE-LIGHTS
Copy of our 1906 Catalogue mailed on request
The EDMUND & JONES MFG. CO.
DETROIT, MICH.



Storage Batteries

are used and endorsed by forty-two of the leading automobile manufacturers.

Specify the WITHERBEE and avoid ignition trouble. Satisfaction guaranteed or purchase money refunded.

Sold by the leading jobbers. Write for descriptive pamphlet.

WITHERBEE IGNITER CO.

541 West 43d St.

NEW YORK

Every operator of an Automobile, Motor Cycle, or Launch should own one of our
AMERICAN POCKET AMMETERS
For testing dry cells. The only RELIABLE pocket ammeter on the market. Lasts a lifetime.

Write for catalog showing our full line of coils, plugs, ammeters, switches, dynamos, etc.

AMERICAN COIL COMPANY
Foxboro, Mass.
Pacific Coast Branch, 306 McAllister St., San Francisco.

Automobile Tire Protectors
For the Prevention of
Skidding, Punctures and Wear

LEATHER TIRE GOODS CO.
Newton Upper Falls, Mass.

E. F. LESTER, Mfr.
ALUMINUM
ARROW BRAND
SOLDER AND FLUX.
FAYETTEVILLE, N. Y.

Eclipse Tops
LOOK BETTER
WEAR BETTER
MADE BETTER
ARE BETTER
than any others.
It's an old story with us. We have been making good tops practically all our business lives.

Write for catalogue,
Eclipse Buggy & Mfg. Co., Fort Wayne, Ind.

Gasoline — SELF — MEASURING — Outfits

For the Automobilist and the Garage.

Guaranteed non-evaporative, airtight, no-leakage.
From tank into automobile reservoir.
Tank underground—Pump in building.
Write for Catalog "M"—it will surely pay you.

WESTERN OIL PUMP CO.
2400 Kosciusko St., ST. LOUIS, MO.

ORIGINAL MANUFACTURERS OF AUTO TOP MATERIALS

We are headquarters for water-proof materials of all kinds and make a specialty of materials used in the manufacture of Auto Tops, Storm Curtains, Slip Covers, etc.
Write for samples and price list.

L. J. MUTTY CO., Boston, Mass.

PACKARD ENAMELED IGNITION CABLES NEVER DISAPPOINT

They are giving entire satisfaction to over 100 high-class automobile manufacturers. Will you permit us to convince you of their worth?

PROOF AGAINST HEAT, GREASE, OILS AND WATER

THE PACKARD ELECTRIC COMPANY
WARREN, OHIO, U. S. A.

CANDY CARBIDE

For FRENCH AUTO LAMPS (Impregnation dans le vide)

Packed only in 10 lb. cans. Price \$2 each.
Discount to dealers in case lot of 12 cans.

SOLE MANUFACTURERS
ACETYLENE GAS ILLUMINATING CO.
105 WALKER STREET NEW YORK

READ MOTOR AGE ... \$2.00 per Year

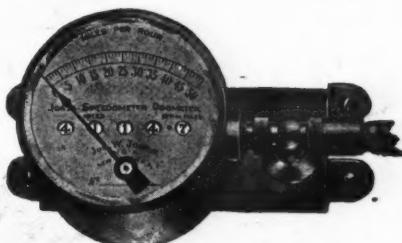


Every Automobilist's Automobile

should be equipped with a Jones Speedometer for the reason that it is recognized as the only *practical* speed indicating device.

The accuracy of the Jones Speedometer is attained by the mechanically perfect application of an absolutely unchangeable law. Its standard of perfection will never be equaled by devices based on theories. In the development of our Speedometer, we experimented with a large variety of devices, employing the principles of hydraulics, pneumatics, magnetism, electricity, etc., but after exhaustive tests discharged them, because found lacking on one essential or another.

Theoretical accuracy does not necessarily mean *practical* accuracy—nor does *initial* accuracy mean *permanent* accuracy.



JONES SPEEDOMETER

122 West 32d Street New York

**THE
London
Tops**
Style
Durability
Quality
LONDON AUTO SUPPLY CO., 1229 Michigan Ave., Chicago

**ALUMINUM, PHOSPHOR BRONZE,
BEARING BRONZE AND BRASS
CASTINGS FOR AUTOMOBILES**
HOFELLER BRASS FOUNDRY CO.
BUFFALO, N. Y.

CRACKED CYLINDERS, GEARS, SHAFTS, Etc.

Cold weather does all kinds of fatal things to cylinders and other automobile parts. Write us for particulars, prices, etc.

NATIONAL BRAZING CO., 83 W. Jackson Blvd., Chicago

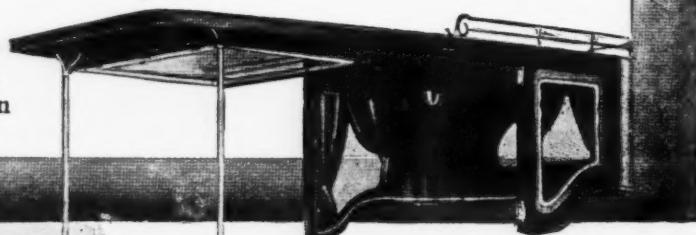
We repair by our Brazing System, making parts repaired stronger and tougher than they were originally. **Brazing is stronger, quicker, cheaper than patching.** In patching every hole drilled for bolts or rivets weakens the casting and the more a patched casting is used the looser it becomes. The metals used in brazing are stronger and tougher than cast iron, making the brazed part stronger than when new.

WELCH

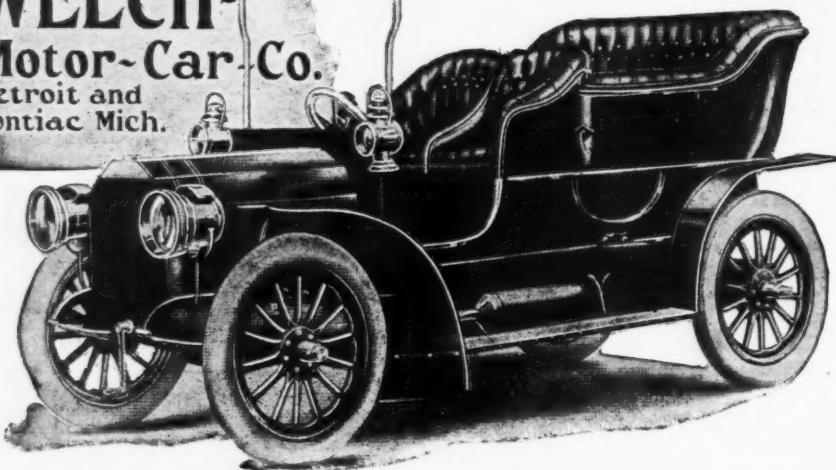
1906 LIMOUSINE CAR 1906 FOR FALL AND WINTER USE PRACTICALLY IMMEDIATE DELIVERIES

Ask for 1906 Catalog just out, describing WELCH PATENT DETACHABLE PULLMAN LIMOUSINE CARS. Seven passenger car to suit all seasons; Cape Top in Summer, Half Limousine in Fall and Pullman Limousine in Winter. 4 to 50 miles on direct drive.

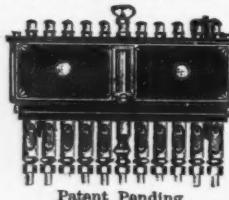
So simple
a child can
operate.



WELCH-
Motor-Car Co.
Detroit and
Pontiac Mich.



A LUBRICATOR FOR ANY CAR, ANY SYSTEM

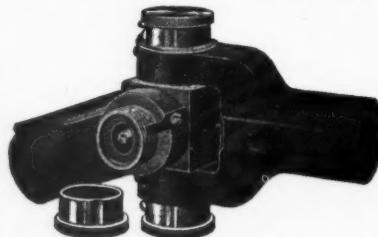


An automatic pressure feed oiler instantly converted into GRAVITY FEED. Each sight feed in itself an automatic pump equally well used with any system of lubrication.

Made with any number of feeds. Write for circular. Manufactured by

J. T. PEDERSEN, 642-644 First Ave., N. Y.

UNIVERSAL JOINTS



Designed for Automobiles and Motor Boats

Taken apart or put together with the hands, no tools needed. Working bearings hardened steel and interchangeable, $\frac{3}{8}$ in. diameter by $1\frac{1}{8}$ in. long and so constructed it is impossible for dirt to get in or the grease to get out. Our circular shows you how this is done. One filling of Grease Cups lasts an ordinary season.

BLOOD BROS. AUTOMOBILE & MACHINE CO.

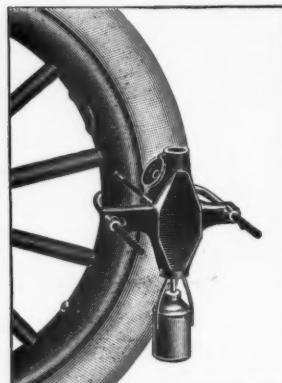
Manufacturers Kalamazoo, Mich.

ANYBODY CAN USE IT

Blowouts, sand-balls, glass cuts or other damaged spots on outer casings; torn off stems, split or punctured to inner tubes vulcanized as good as new with our Vulcanizers.

We want to send you circulars, and what others say.

"Stitch-in-Time"
Vulcanizer Co.
Topeka, Kan.,
U. S. A.



"OILEJAMMER"

THE OIL GUN WITH THE EXTENSION NOZZLE PREVENTS BREAKAGE KEEPS YOUR HANDS AND CLOTHING CLEAN

THE BEST OIL GUN EVER MADE AT ANY PRICE
BEST MATERIALS, WHEN EXTENDED 30 INCHES,
CLOSED 11 INCHES. SENT PREPAID FOR \$1.50

THE MOTOR CAR SUPPLY CO.
1427 MICHIGAN AVENUE, - CHICAGO

"EVERYTHING FOR YOU AND YOUR AUTO"

**SPIRAL TUBING RADIATORS
HOODS ANY STYLE OR SIZE
LONG MFG. CO.**
381-3-5 Wabash Ave. CHICAGO



**Gilbert Auto
Fabric Supplies**

LOOK FOR THE NAME

FOR SALE AT LEADING
SUPPLY HOUSES. CATA-
LOG SENT ON REQUEST.

The Gilbert Mfg. Co.
New Haven, Conn.



Of course if we would spend all our money for advertising as other people do, we could not put the exceptional values in our plugs as we do. Read this testimonial:

Ralph C. Lewis Levi Matthews THE LEWIS & MATTHEWS Co.

Foreign Automobile Selling Agts. Garage and Supplies Domestic 66, 68, 70 Stanhope St. Repairs Cars Cable Address: "Autohead" Used Cars Telephone Tremont 711 Boston, Mass., June 23, 1905

Herz & Company, 187 Elm St., New York, N. Y.: Gentlemen—Herewith kindly find check to cover the amount due you. Also please enter our order for twelve (12) of your Bougie Mercedes 1905 plugs in the metric 19 m. m., size similar to our last order. We wish to express ourselves as very highly pleased with the Bougie Mercedes plugs and feel sure you will be glad to know that through all our automobile experience we have never found a plug so thoroughly reliable.

Very truly yours, THE LEWIS & MATTHEWS Co., Ralph C. Lewis (M. M.)

The chauffeur shouts in tones of mirth, "BOUGIE MERCEDES" best on earth. It's DOUBLE STONE, will never crack. Absolutely self-cleaning.

Six months' guarantee. Price \$2. The greatest value ever offered. HERZ & CO., 187 Elm St., New York Write for Vademecum of Ignition.



Simplicity Automobile Extension Cape Tops Simplicity Spray Hoods

CHARLES P. McCLELLAN, Fall River, Mass.

1905 YANKEE GRADE METER. PRICE \$7.50.

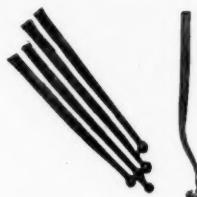
This Grade Meter is the handsomest article of its kind on the market, and is positively accurate. No vibration of the indicating hand.

YANKEE MICA SPARK PLUG. PRICE \$1.50.

Double Insulation, Compression End, Rigid Points, most reliable and popular Plug on the market. 40,000 sold last year. Guaranteed 90 days.

Everything for the Automobile. Mammoth catalog for 10 cents in stampa.

M. J. WILLIS CO., 7 Park Place, New York



Auto Top Bronzes
Bronze Separators,
Snaps, D Rings, Nuts,
Screws, etc. Also Mud
Guards, Dashes, Tool
Boxes, Guard Bolts, etc.
C. W. COOPS CO.
3 Appleton St., Boston, Mass.

BESTO GO STORAGE BATTERY

Essentially different from
other Lead Batteries

SEND FOR CATALOG

Miller Signal Co., 302 JACKSON BOULEVARD,
CHICAGO

VALVELESS-PUMPS WITHOUT STUFFING BOXES OR SPRINGS

All Your Oiling Troubles Eliminated!
Any Number of Feeds
Write for Catalogue

Madison-Kipp Lubricator Co., Madison, Wis.

"ATWOOD
STAY-LIT"
LAMPS ARE THE BEST
ATWOOD MFG. CO., Makers
Send for Catalogue Amesbury, Mass.

"TRIUMPH" GASOLENE TANK GAGE

Applicable to tanks with or without pressure to show quantity of gasoline.

SIMPLE, RELIABLE, SUPERIOR IN WORKMANSHIP

The "Triumph" Gasoline Tank Gage is part of the regular equipment of all "Pierce Great Arrow" Cars for season of 1906. The only Gage endorsed by builders of first class cars.

See that your New Car has a "Triumph" Gage

Boston Auto Gage Company

FACTORY: 8 Waltham Street, Boston, Mass.

OFFICE: 613 Old South Bldg.

Rajah The Most Reliable
SPARK PLUGS IGNITION ABSOLUTELY SURE
RAJAH AUTO SUPPLY CO., 140 Washington Price, Postpaid \$2.00
Street New York

SHELBY SEAMLESS-STEEL-TUBING
BEST MADE FOR AUTOMOBILE CONSTRUCTION.
SEND SPECIFICATIONS WE QUOTE PRICES
SHELBY STEEL TUBE CO.
PITTSBURG, PA.
BRANCH OFFICES - NEW YORK - CHICAGO.

The Ball Improved Transmission
and REVERSE GEAR
—FOR—
Automobiles and Motor Boats
MADE ONLY OF SPUR GEARS
Patented April 9, 1901; Nov. 3, 1903; Jan. 12, 1904;
Feb. 23, 1904.
NEW YORK GEAR WORKS, 56 Greenpoint Ave., Brooklyn, N. Y.
Western Agents: J. H. Neustadt Co., St. Louis, Mo.

BY ALL MEANS HEAR
THE GABRIEL HORN
Before Deciding. A Musical Horn for
Automobiles and Auto Boats

Blows a full, strong blast from exhaust from gasoline engine, or can be attached to steam, same as ordinary whistle; blows with less than one pound pressure.

Each horn is tuned to a musical key—no discordant screeching note—is easily blown, and is strong and durable.

Comes in three styles—two, three or four horns.
Write today for Catalogue, giving prices and full information.

GABRIEL HORN AND MANUFACTURING CO.
970 Hamilton St., Dept. B, CLEVELAND
New York Branch, 148 West 56th St.

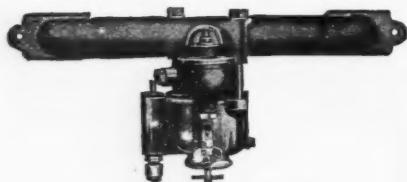
OLD Tires Made NEW
New Tires Made Puncture-Proof

NEWMASTIC FILLING
For Clincher and Single Tubes

Just as Resilient as a Pneumatic
Just as Safe as a Solid Tire
How Do We Do It?
Write Us and Learn

NEWMASTIC TIRE CO.
1303 Michigan Ave., CHICAGO, ILL. Tel. South 1301
ST. LOUIS, MO.

HOLLEY CARBURETORS



Special Model E for 1905 Winton

We are constantly bringing out special carburetors for different makes of cars. If you have an old car

Watch Our List

If you don't find one for your make of car, write us.

MODEL E STANDARD

Prices, top or side outlet, are as follows:

	With Pipe Thread
1-2 in. and 3-4 in. gasoline outlet	\$11.00
1 in. gasoline outlet	12.00
1 1-4 in. gasoline outlet	13.00
1 1-2 in. gasoline outlet	14.00

Increase the power of your car by equipping it with one of the following special HOLLEY CARBURETORS.

SPECIAL SIZE FOR

Oldsmobile Runabout	\$12.00
" Tonneau Car	11.50
" Touring Runabout	11.50
Ford 10 H.P., Model C	11.50
Winton, Model B and C	18.00
Cadillac, single cylinder	13.50
Northern, Runabout	12.50
" 2-cylinder Touring Car	14.00
Franklin 4-cylinder Runabout, 10 and 12 H.P.	12.00
Two-cylinder Buick	14.00
8 H. P. Single-cylinder Crest	13.00
Two-cylinder Queen	13.00

Holley Carburetors are used exclusively by the Olds Motor Works, Winton Motor Carriage Co., Ford Motor Co., Mitchell Motor Car Co., and other successful manufacturers.

Write for Circular E Full information sent on request

HOLLEY BROS. CO.
672 Beaubien St., DETROIT, MICH.

Pardee-Ullmann Co.
Agents for
PACKARD
AND
FRANKLIN
1218-1220 Michigan Avenue
Phone 557 South CHICAGO, ILL.

**EVERYTHING IN
SUPPLIES
FOR OWNER AND DEALER**
SEND FOR CATALOGUE NO. 49
EXCELSIOR SUPPLY CO.
ESTABLISHED 1876 CHICAGO.

The McDUFFEE Automobile Co.
Distributors for
Stoddard-Dayton and Royal Tourist
Phone South 1297
1449 Michigan Ave. CHICAGO

Cadillac Automobile Co. of Illinois
1312 Michigan Avenue, Chicago

CADILLAC
Four Cylinder, High Power Touring Car
Light Touring Cars Runabouts Delivery

C. A. COEY & CO.
Illinois and Eastern Iowa Agents for the
THOMAS FLYER

Always on hand—Bargains in New and Used Cars of all descriptions :: :: :: PHONE CALUMET 1042
1323-1325 Michigan Avenue, Chicago

SENSATIONAL PRICES

We are closing out all short lines, together with all second hand and shop worn models to make room for 1906 agency goods now coming in—Moline 4-cyl. 20 h. p. side entrance, new \$1250; Moline, 2-cyl. 12 h. p. side entrance, new \$600; Hoffman 10 h. p. tonneau, new \$400; Murray runabout, \$200; Oldsmobile, \$250; Buckboard, \$200; Gale, 8 h. p. new, \$350; Winton, \$700; and many others at sacrifice prices. We are Chicago agents for "The Moline," "Frayer-Miller" "Gale" and exclusive United States importers for the Benz, Manheim, Germany. Call and see us or send for Catalogue.

MEAD MOTOR CO., 1243-1245 Wabash Ave., CHICAGO

TIRE REPAIRS
All makes and types given equal attention
Correspondence solicited

RUBBER GOODS REPAIR CO.
89 16th St., Chicago. Phone South 1280

LAMBERT Friction-Drive Automobiles...
12-16-32 h. p., \$1000 to \$2000
Write for Catalogue

ADLAND MOTOR CO.
1303 Michigan Ave., Chicago

OLDSMOBILE
Agents and Distributors for Illinois and Wisconsin
THE GITHENS BROS. CO.
1528 Michigan Ave., Chicago
Telephone, South 1658

GOOD AGENTS WANTED
PREMIER
FOR ILLINOIS AND IOWA
RALPH TEMPLE
309 Michigan Avenue CHICAGO

The Importers' Company
AGENTS FOR
Richard-Brazier Cars
1400 Michigan Avenue CHICAGO

LOBEE ROTARY PUMP
4000 in use demonstrating its efficiency with all types of radiators for circulating water or oil in gasoline motors. **Lobee Pump Co.**, 240 Terrace, Buffalo, N. Y. C. E. Miller, Agt., 97 Reade St., New York, A. L. Dyke Auto Supply Co., 4703 Olive St., St. Louis, Mo.

Searchmont Cars Rebuilt
Searchmont Repair Parts of every description for sale.
FAIRMOUNT ENGINEERING WORKS
3209 Spring Garden Street, Philadelphia, Pa.

ROBERT VOLT-AMMETER
For General Battery Testing—Guaranteed
Tests both Volts and Amperes.
3-VOLTS 6-VOLTS
30-AMPERES 30-AMPERES
Send for Catalogue.
ROBERT INSTRUMENT CO.
58 Shelby St. Detroit, Mich.

POPE -TOLEDO
-HARTFORD
-TRIBUNE
-WAVERLY

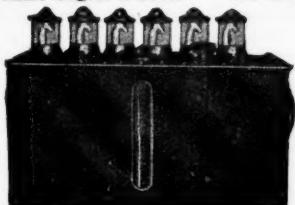
ORLANDO F. WEBER CO.
(INCORPORATED)
Distributors for
CHICAGO and MILWAUKEE
1322-26 Michigan Ave. 321-26 Fourth St.
Phone 1099 South Phone 2781 Main

BOWSER GASOLENE TANKS

We manufacture Gasoline Storage Outfits—all kinds. Self-measuring Outfits for Garages; smaller, less expensive ones for private automobiles. It will pay you to investigate our Long Distance Gasoline Storage System "Tank buried—Pump located in building." Over a dozen styles from which to select. Ask for catalog. S. F. BOWSER & CO., Inc., X V Ft Wayne, Ind.

Force Feed Lubrication

Constant Sight Feed. No Liquids



McCord & Co., 1402-80 Old Colony Bldg., Chicago

E. J. Day & Co., Pacific Coast Distributors
324-326 Golden Gate Avenue, San Francisco, Cal.

Complete Lists of
**Auto Owners, Dealers,
Garages and Jobbers**
MOTOR DIRECTORIES CO., Inc.,
Successor to
AUTO DIRECTORIES CO.,
108 Fulton St., N. Y. City

Perfect vs. Imperfect Ignition

Batteries WILL play out but never when fed by an
APPLE AUTOMATIC BATTERY CHARGER. The current delivered is steady and unchanging, insuring fat, hot sparks. See us at N. Y. and Chicago Auto Shows.

The Dayton Electrical Mfg. Company
75 Beaver Bldg. Dayton, Ohio

All Leading Automobile Manufacturers Use this Cushion Spring.

Ask for Samples and Prices.

National Spring & Wire Company, Albion, Mich.

Truffault-Hartford Suspension

Whether you own the lightest Runabout or the heaviest Touring Car, you cannot afford to be without it. Cars under 1500 pounds, \$40; cars over 1500 pounds, \$60; 4 suspensions.

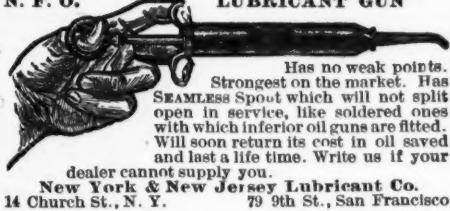
HARTFORD SUSPENSION CO.
69 Vestry Street, NEW YORK CITY

THE U. S. JACK
WITH UNIVERSAL HEAD
LIFTS ANY WEIGHT
CAR UP TO 6000 Lbs
A child can operate it twice as fast as a man with other jacks. Impossible to get out of order. Complete weight 51-4 lbs. Thumb screw prevents rattle. Write us if your dealer has none.
U. S. JACK CO., 352 S. Claremont Av. Chicago

STEEL CASTINGS
FOR AUTOMOBILES A SPECIALTY
WRITE FOR SAMPLES AND PRICES
MILWAUKEE STEEL FOUNDRY CO.
MILWAUKEE, WIS.

N. F. O.

LUBRICANT GUN



Has no weak points.
Strongest on the market. Has
SEAMLESS Spout which will not split
open in service, like soldered ones
with which inferior oil guns are fitted.
Will soon return its cost in oil saved
and last a life time. Write us if your
dealer cannot supply you.

New York & New Jersey Lubricant Co.

14 Church St., N. Y. 79 9th St., San Francisco

THE SOLVAY PROCESS COMPANY'S

"KAL-KRYSTAL" makes the best non-freezing
solution for Automobile use. Neutral and non-corrosive. Stands 50
degrees below zero Fahr. Put up in 10-pound cans.
Makes 2 gallons of solution ready for use. For sale
by all Automobile Supply Houses.

CARBONDALE CHEMICAL CO.
739 UNITY BLDG., CHICAGO**Your \$5.00 Back**If after 30 days' trial you don't
feel absolutely sure the**SKINNER**
COMPOUND AIR PUMPis the best automobile tire
pump, and the easiest to op-
erate, that you have ever
tried or ever seen.Compact, light and con-
venient for carrying.

\$5 Express Prepaid

SKINNER & SKINNER, MFRS.
4134 Indiana Ave., Chicago**ALUMINUM****Aluminum
Automobile
Parts a Specialty**The Pittsburgh Reduction Company
Pittsburgh, Pa.**EVERYTHING FOR
Man, Motor and "Mechanician"**Specialties and Leather and
Wool Winter Clothing**A. L. DYKE AUTO SUPPLY CO.**OLIVE AND WALTON STREETS
ST. LOUIS, MO.ROBT F. BRITTON
Pres. and Mgr.ROY F. BRITTON
Secy. and Treas**DIAMOND WRAPPED TREAD
TIRES**

DIAMOND RUBBER CO., AKRON, OHIO

HOT SPRINGS, ARK.

Only 20½ Hours from Chicago

VIA THE

WABASHYou can leave Chicago daily at
11:30 A. M., on the**BANNER BLUE LIMITED**

the finest train on earth, and
connect in Union Station, St.
Louis, with the Hot Springs
Special on the Iron Mountain,
reaching Hot Springs next
morning at 8 o'clock.

Write for free Booklet telling
all about this popular health
and pleasure resort.Ticket Office, 97 Adams St.
CHICAGOC. S. CRANE, F. A. PALMER,
G. P. & T. A., St. Louis. A. G. P. A. Chicago.**DIAMOND CHAINS**Our chains outwear all others. Replace your worn
out chain with a "DIAMOND," which fits any stand-
ard sprocket.

Diamond Chain & Mfg. Co., Indianapolis.

**HIGH-GRADE
EXTENSION
AND VICTORIA
TOPS**
THE MYERS-DAYTON TOP CO., Dayton, Ohio

AUTO TRIMMINGS

The right kind that puts a high grade appear-
ance to a high grade car. We make
'em. Space No. 119 N. Y. Show.

AUTO BRASS & ALUMINUM CO.
FLINT, MICH.Specify **Auto Cle** on Your
...an... 1906 CarWRITE FOR CATALOG
RAILWAY APPLIANCES CO.
Old Colony Building :: :: Chicago

There was a time

when a regular and reliable ignition was a problem. This problem is solved today by the **HERZ TIMER**. We have made and sold over 70,000 of these instruments last year, to the most prominent manufacturers in this country, as well as in Europe, and are making now four distinctly new models for four of the leading manufacturers in America. The reason for this success: It's Tool Steel vs. Tool Steel, best Sheffield grade obtainable; **Sticking Vibrators** absolutely impossible; running packed with grease; built like a watch, tool maker's work throughout. We make 18 models and fit any make of motor. State make of your motor when ordering.



HERZ & CO.
187 Elm St. NEW YORK

Write for the Vademecum of Ignition.

"Everything for the Autoist but the Auto"

**THE NEW BOOK IS READY
PLEASE SEND FOR IT**

We have issued a new illustrated catalogue de luxe of 200 pages devoted to the new imported and domestic models of automobile apparel for men and women for Fall and Winter service. Presented are garments of fur, leather, cloth and rubber, together with a comprehensive series of requisites. To you we would be pleased to mail a copy without charge.

Saks & Company Broadway, 33d to 34th Streets NEW YORK



The "B. & S."
Auto Wrench



**IS THE WRENCH
WITHOUT A
RIVAL**

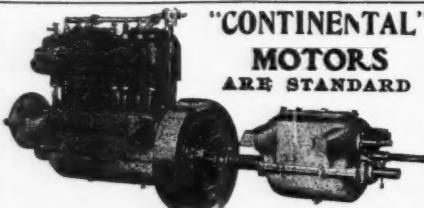


DOES YOUR
1906 KIT
CONTAIN IT?



The Billings & Spencer Co.

HARTFORD, CONN.



"CONTINENTAL"
MOTORS
ARE STANDARD

Our "Continental" Motive Power Equipment, consisting of 2 or 4 cylinder motor, (10 to 4 h. p.) assembled with Clutch and Shaft Drive Transmission, is ready to put in your car.

HIGHEST EFFICIENCY LIGHT WEIGHT RIGHT PRICE
AVOID INFERIOR IMITATIONS

ASK FOR CATALOGUE

Continental Motor Mfg. Co. 240-244 W. LAKE ST.
CHICAGO
K. F. PETERSON, Direct Factory Representative

MISCELLANEOUS.

Advertisements under this head 3 cents per word first insertion; 2 cents per word for each insertion thereafter. Ads set in any style other than regular setting, 24 cents a line first insertion, 16 cents a line for each insertion thereafter.

Special rates for continuous advertising in these columns upon application.

FOR SALE—Pope-Toledo, 30 H. P., 1905, front entrance; Victoria top; new Continental tires; full equipment; fine condition; owner going abroad. \$2,000. Delight Automobile Co., Omaha, Neb.

FOR SALE—Model N Packard; fine condition; with top, headlights, gas tank, extra heavy Fisk tires, one extra tire. Price \$3,000. C. F. Steele, Alpena, Mich.

WANTED—A thoroughly competent automobile salesman who has had good record and can show it, to sell Cadillac (full line) and one other well known car. Will pay salary and liberal commission to right man. Large western city. B. A., care MOTOR AGE.

FOR SALE **Automobile White Steamer**

Touring car, seating 5, model 1904, first-class condition, with cape top, Morse steam pump and big lights, extra. Price \$800. E. A. Slack, Brookline, Mass.

FOR SALE—1906 Model F White Steamer, with cape top and acetylene lamps and generator. Color dark blue. New Diamond tires on all wheels. Car has been used for about one month. Guaranteed in first-class condition. Immediate delivery. Address W. M. D., care MOTOR AGE.

TO TRADE—Model A Cadillac, with tonneau; condition good; will sell or trade for larger car. Address Box 6, Prophetstown, Ill.

WANTED—Your automobile tires and tubes to vulcanize. Retreading our specialty. We also manufacture large vulcanizers. We save you one-third. Charles E. Miller, Anderson, Ind.

FOR SALE CHEAP—16 H. P. Buckmobile Touring Car, motor under hood. Complete with top; five lamps, horn, tools, etc. Carry five passengers; plenty of power; fine condition. Also one Lackawanna slide transmission gear for shaft drive. Also one 15 H. P. Buckmobile with detachable rear seat; fine condition. Utica Motor Car Company, Utica, N. Y.

FOR SALE—Model B Winton, fitted with canopy top, glass front, pair of large searchlights, brass side lights, tall light, extra tires and inner tubes, Weed chains, 1906 Model K Winton commutator and coil. Everything in first-class condition. Has seen very little use. Cost \$3,100. Price, quick sale, \$1,700. Apply The Reading Automobile Co., Reading, Pa.

FOR SALE—40-horsepower auto. engine and transfer side chain drive with clutch complete, \$350. A. M. S., 901 N. Fairfield Ave., Chicago, Ill.

FOR SALE—Oldsmobile runabout in perfect condition; leather top; back seat; extra tire; carbide lamps; Pittsfield timer, paint and all tires good. Price \$300. Description by mail. Dr. T. T. Smith, Canton, Ill.

FOR SALE—Fine modern shop, approximately 60 M square feet, equipped with up-to-date machinery, admirably adapted for the manufacture of automobiles and parts. Excellent location in thriving Indiana city of 20,000. Unexcelled shipping facilities. On two trunk lines. Labor first-class and moderate in price. No strikes. Capacity 200 men. Would make favorable terms. Send for full particulars. Box 3, care MOTOR AGE.

FOR SALE—New 1906 Model F, \$2,800, White Steamer; standard equipment; used but little. A chance to get the best car made at a reduction. Located in Ohio. Need the money. H. J., care MOTOR AGE.

FOR SALE—Daimler delivery wagon in first-class condition. Price \$400. Great bargain. Fairmount Engineering Works, 3207-11 Spring Garden St., Philadelphia, Pa.

FOR SALE—One 1905 Pierce Great Arrow, in A1 running condition; also top regular equipment. Address C. F. K., 1293 Woodward Ave., Detroit, Mich.

COMPETENT MEN as instructors in progressive automobile school; must undergo examination and show fitness for the work. Instructor, care MOTOR AGE.

FOR SALE—Very cheap: Ford four-cylinder, Ford two-cylinder, Winton two-cylinder, Rambler two-cylinder, Improved Rambler E one-cylinder. Orient buckboard, mostly 1905 cars. Prices and descriptions extremely interesting. A card will bring the information. E. S. Youse, Reading, Pa.

FOR \$2 PER YEAR

READERS OF

MOTOR AGE

Receive 1560 pages of interesting mechanical descriptions and touring hints

WHERE CAN YOU BEAT THIS?

FOR SALE—Packard Model L; first class condition, recently thoroughly overhauled at factory; extra equipment, 4½ inch Diamond tires on rear wheels; brass plated Veedee dashboard odometer; Hartford suspension on rear springs; complete set of oil cups on spring bolts; Gray & Davis acetylene lamps with Solar generator; B. & J. lockswitch; T. P. C. tire pump; muffler cut-off for attaching Gabriel horn; large dope cup on dashboard feeding driving shaft, steering wheel bearings; also two bearings on commutator shaft; cup has two extra feed pipe connections. Price, \$2,300 cash.

Autocar—Tonneau fitted with extra seat; engine recently overhauled and put in first class condition; guaranteed as good as new; tires extra heavy and recently purchased; full lamp equipment. If you want a first class machine at a bargain, write the Michigan Stove Co., 1022 Jefferson Ave., Detroit, Mich.

NEW TIRES, 28x2½, \$9; RUBBERINE FILLED, \$13.50. 28x3 rubberine filled, \$16. 30x3½ or 4 rubberine filled, \$22 to \$25. Rubberine saves tires, time and worry.

Automobile Palace, 152 W. Jackson Bl., Chicago

FOR SALE—Double chain drive transmission and other automobile parts. W. Roulet, 107 Washington St., Chicago.

WILL TRADE ten or twenty acres of garden land, 10 miles west of Toledo, Ohio, on interurban line, for automobile. H. G. Welsh, 514 North Main, Hutchinson, Kan.

WANTED—Manager and salesman with \$1,000 to \$2,500 cash in automobile company in eastern Iowa. Address Iowa, care MOTOR AGE.

FOR SALE—Prescott combination 2-4 passenger steam car, in perfect running condition; brand new Model C Mason engine; all improvements; bargain if sold at once. For further description write R. S. Trulock, El Reno, Okla.

FOR SALE—Packard late 1903 Model F; recently overhauled at factory. Will equip with brand new tires and sell for \$750 cash. First check takes it. H. W. Beach, Montrose, Pa.

FOR SALE

THOMAS TOURING CAR—1904 model; 3-cylinder; seats five persons; perfect condition; thoroughly overhauled by factory recently; this car was driven by the owner eleven hundred miles from Macon, Mo., to Buffalo without an accident and never missed fire once on the trip; new tires this season; I refer to the E. R. Thomas Motor Co., of Buffalo, as to condition of car; my reason for selling is that I have purchased a larger type car; price and full description on application. Address owner, William R. Compton, Macon, Mo.

FOR SALE—8 H. P. Olds engine in runabout car; 2 new Morgan & Wright tires; \$200. Box 143, Cayuga, Ind.

FOR SALE—1905 Oldsmobile light tonneau car; 10 horsepower; paint, machinery and tires good as new; cost, with extras, \$1,050; a bargain at \$850. Address Ed Connine, Wexford, Mich.

FOR SALE—1905 or Model E WHITE, with complete touring equipment, i. e., gas headlights, cape top, portfolio, extra tool boxes, complete tool equipment, including some specials, extra tires, tire irons, large assortment of repair parts, jack, etc. Wired for electric lights, gauge lamp, 1906 engine; speed and odometer. Will demonstrate that car is in perfect condition; has just been repainted. Make an offer. Box 71, care MOTOR AGE.

FOR SALE—1½ h. p. motor cycle engine, \$20. C. Shook, Waterloo, Iowa.

WANTED—Automobile in exchange for good lots or land; will give a good trade. Box 81, Independence, Iowa.

FOR SALE—Attachable motor bicycle outfit at fall prices. Send for literature. Shaw Mfg. Co., Galesburg, Kan.

HIGH-GRADE Marine and Automobile Engines, 2 and 4 cycle, 2 to 30 h. p. Lowest prices. A. J. Houle Motor Works, S. East St., Holyoke, Mass.

WANTED—Model "B" Cadillac; must be in first class condition; name tires, lamp equipment and accessories and price. R. T. Davis, Jr., 26 S. Water St., Cleveland, O.

FOR SALE—Searchmont auto body with detachable tonneau; finely upholstered in leather; in perfect condition; price, \$25. E. B. S., Ossining, N. Y.



DON'T FAIL
to hear Mr. B. A. Gramm's talks on
The Logan

at the New York Automobile Show, 69th Regiment Armory, Section E, Basement

Logan 1906 Line

Runabout	10 H. P.	Air Cooled
Light Touring Car	20 H. P.	Water Cooled
Large Touring Car	30 H. P.	Water Cooled
Light Delivery Car	10 H. P.	Air Cooled
2-Ton Delivery Truck	30 H. P.	Water Cooled
20 Passenger Bus	30 H. P.	Water Cooled

Some Exclusive Logan features

Equalized Spring Trussed Frame which absorbs many jolts and jars which would otherwise go to engine and occupants.

Sliding Gear Transmission in which it is impossible to strip the gears.

Transmission Brake operated by reversing clutch lever.

High speed gear controls all speeds from one mile per hour to limit.

Special Fly Wheel Construction which gives one-fifth more power from cylinders of same bore and stroke.

Simple in operation—Two levers and one pedal control all gears, brakes and clutch.

Write for Catalogue A-124, describing these and other features.

The Logan Construction Co.
Chillicothe, Ohio

"THAT CAR OF QUALITY"

FOR SALE—Packard Model L, in A1 condition, fully equipped with lamps; price \$2,000. Also one Packard model N, as good as new, fully equipped with head lamps and new Bailey tread tires; price \$2,600. One 1904 Franklin touring car, with full set of lamps, detachable tonneau and Goodyear detachable tires, almost new; can be bought for \$1,000 if taken at once. Bates-Odenbret Auto Co., Milwaukee, Wis.

Scrap Auto Tires
We Buy Them

LAUN-CARLSTEN CO., 90 Metropolitan Blk., Chicago

FOR SALE—Complete sets of castings of automobile and marine engines with blue prints, single cylinder, 4 H. P., castings, \$25; double cylinder 8 H. P. castings, \$40; four cylinder 16 H. P. castings, \$95. Witte Gas & Gasoline Engine Co., 47-49 S. Canal St., Chicago.

FOR SALE—1904 Winton; canopy top; new sprocket; new chain; extra tire; oilers on dash; good tires. In good condition. Price \$1,000. Ralph E. Clarke, Coldwater, Mich.

AGENTS WANTED—For our automobile and marine engines. Spark plugs, 50c and \$1. direct to consumer. Coils, carburetors and all supplies at corresponding prices. Columbus Screw & Machine Co., Columbus, O.

AUTOMOBILE DEALERS EVERYWHERE—We have a live proposition to offer dealers and agents in every town and city to handle our ready to deliver cape cart tops. Auto Top & Equipment Co., 1604 Broadway, New York City.

FOR SALE—8-10 passenger wagonette; sample car 1905-6 Model; steam; price and description on application. Thompson Auto Co., Olneyville Sq., Providence, R. I.

AUTOMOBILE BARGAINS

Through a business deal we obtained a few standard \$1,400 side entrance touring cars, 20 H. P. double opposed engine, and \$750 runabouts, made by one of the oldest automobile-makers in the country. ALL NEW GOODS. Shipment made direct from factory. Full description on application. The opportunity of a lifetime. Write today, making best cash offer. Having already made our profit on these cars, we can afford to let them go at a sacrifice. Best cash offer takes first machine, next best second, etc., until closed out regardless of cost. No trades. Skinner & Skinner, 4134 Indiana Ave., Chicago.

\$300 GROUT SURREY. Thoroughly overhauled; fine condition. Dr. Frank Graham, Tennessee Trust Bldg., Memphis, Tenn.

FOR SALE—12-15 H. P. touring car in good condition; cost \$1,400, will sell for \$500. Write for particulars to F. R. Morrison, Ashatabula, O.

Majestic AUTOMOBILE SPECIALTIES ARE THE BEST

WE ARE HEADQUARTERS FOR
Everything for the Automobile



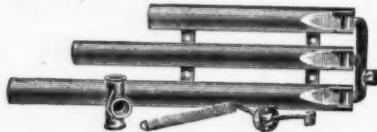
Majestic Detachable Clincher Tires

as good as any—
with a full guar-
antee—but dis-
counts greater.

It will pay you to let us show
you our proposition.

Majestic Lamps
are good lamps and prices the
lowest.

Majestic 3-Tube Horns
at prices that will startle. Brass
throughout. Perfectly toned and
of the best construction.



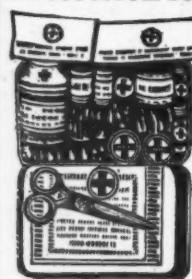
Manhattan Storage Co.

42 and 44 Cortlandt St., New York

WE WILL EXHIBIT AT THE FOLLOWING AUTO SHOWS:

New York, Madison Square Garden, January 13 to 20; Space 203. Chicago Coliseum, February 3 to 10; Space 269-270. Boston, Mechanics Hall, March 10 to 17; Space 131-132

Protection for Automobilists



Sixteen articles in a
metal case for every-
body who is liable to in-
jury. Bandages, Dress-
ings, Remedies. Qual-
ity Guaranteed. Send
us your address and we
will send the case; if you
are satisfied after exam-
ination, send us one dol-
lar; if not, return the
case at our expense.
Every automobilist
ought to have one. Send
for circular.

U. S. Emergency Case Co.
11 Weaver Bldg., Utica, N. Y.

LEA TIRE PUMP

makes pumping easy. Has ad-
justable crank for short or long
stroke. No backache, no "puff-
ing." Gives same pres-
sure on all tires. They
last longer.
Book B illustrates it.
Write to-day.
Ask also for proposi-
tion to agents.

William S. Jones
112 N. Broad Street
Philadelphia

Sole Selling Agent for MOTOR CAR SPECIALTY CO., Treton, N. J.

Hyatt Roller Bearings

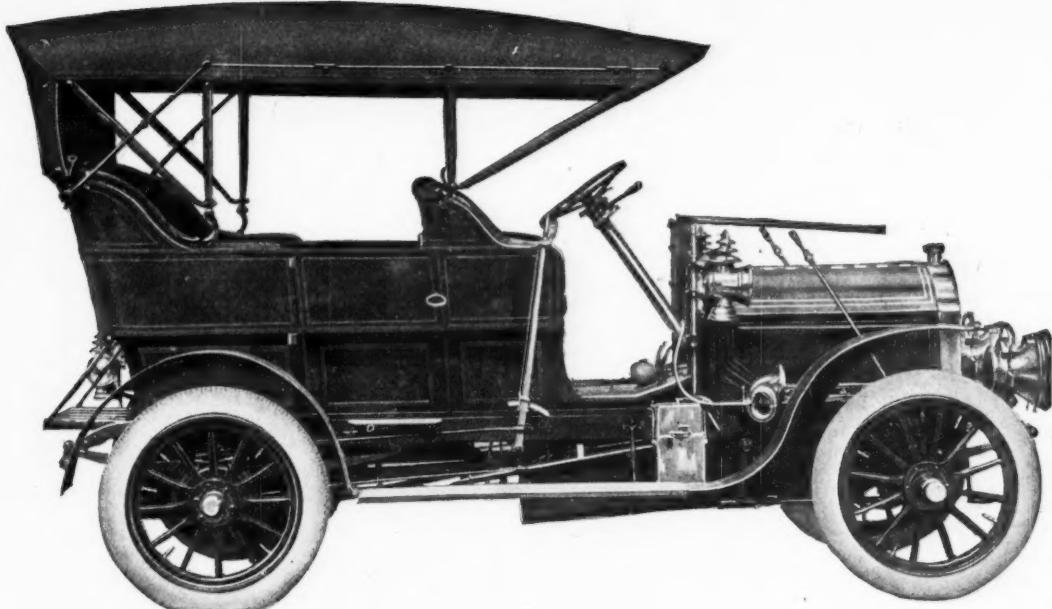
TURN FRICTION INTO ENERGY

HYATT ROLLER BEARING CO.
Harrison, New Jersey

ARE YOU FROM MISSOURI?

INDEX TO ADVERTISEMENTS

Acetylene Gas Illuminating Co.	89	Diamond Rubber Co.	93	London Auto Supply Co.	89	Robert Instrument Co.	92
Adams Co.	76	Dietz, R. E. Co.	76	Long Mfg. Co.	90	Rose Mfg. Co.	70
Adland Motor Co.	92	Dixon, Joseph, Crucible Co.	88	Lozier Motor Co.	36	Royal Battery Co.	80
Aerocar Co.	57	Dolson Automobile Co.	75	McClellan, Chas. P.	91	Royal Motor Car Co.	83
American Battery Co.	88	Duquesne Construction Co.	69	McCord Co.	93	Rubay, Leon	88
American Coll Co.	89	Dyke, A. L., Auto Supply Co.	93	McDuffee Automobile Co.	92	Rubber Goods Repair Co.	92
Apperson Bros.	56	E. H. V. Co.	66	Madison-Kipp Lubricator Co.	91	Rushmore Dynamo Works.	72-73
Aster Co.	84	Eclipse Buggy & Mfg. Co.	89	Madison Square Garden Show	74	St. Louis Motor Car Co.	45
Atwood Mfg. Co.	91	Edmunds & Jones Mfg. Co.	89	Manhattan Storage Co.	96	Saks & Co.	94
Austin Automobile Co.	62	Eldredge Electric Mfg. Co.	88	Marion Motor Car Co.	48	Schrader's, A., Son.	80
Auto Brass & Aluminum Co.	93	Electric Storage Battery Co.	87	Marlborough Hotel	83	Shawer Co.	87
Automobile Club of America	64	Electric Vehicle Co.	43	Matheson Motor Car Co.	78	Shelby Steel Tube Co.	91
Automobile Equipment Co.	88	Elmore Mfg. Co.	61	Mead Motor Co.	92	Skinner & Skinner	93
Badger Brass Mfg. Co.	78	Excelsior Supply Co.	92	Michelin Tire, American Agency	71	Spicer Universal Joint Co.	86
Baker Motor Vehicle Co.	64	Fairmount Engineering Works	92	Miller, Chas. E.	82	Spiltdorf, C. F.	80
Baldwin Chain & Mfg. Co.	85	Fellwock Autopop Co.	88	Miller Signal Co.	91	Springfield Metal Body Co.	86
Ball-Flinz Co.	88	Firestone Tire & Rubber Co.	68	Milwaukee Steel Foundry Co.	93	Standard Roller Bearing Co.	86
Beaver Mfg. Co.	76	Fisk Rubber Co.	70	Mitchell Motor Car Co.	40	Stearns, F. B., Co.	41
Berkshire Automobile Co.	79	Ford Motor Co.	34	Moline Automobile Co.	81	Steel Ball Co.	76
Billings & Spence Co.	94	Franklin, H. H., Mfg. Co.	33	Monon	86	Stevens, J., Arms & Tool Co.	37
Blostrom, C. H., Motor Co.	38	Frazier, W. S., & Co.	86	Morgan, W. J.	73	Stitch-in-Time Vulcanizer Co.	90
Blood Bros. Automobile Machine Co.	90	G & J Tire Co.	59	Morgan & Wright	Cover	Stolp Mfg. Co.	85
Borbeln, H. F., & Co.	88	Gabriel Horn & Mfg. Co.	91	Motor Directories, Inc.	93	Streit, A., Machine Co.	84
Boston Auto Gage Co.	91	Garford Co.	77	Motor Age	42	Supplementary Spiral Spring Co.	77
Bowser, S. F., & Co.	93	Gauss, L. T.	88	Motor Car Equipment Co.	85	Swinnehart Clincher Tire & Rubber Co.	77
Brennan Mfg. Co.	81	Gilbert Mfg. Co.	90	Motor Car Specialty Co.	96	Syracuse Aluminum & Bronze Co.	87
Briscoe Mfg. Co.	93	Githens Bros. Co.	92	Motor Car Supply Co.	90	Temple, Ralph	92
Brown, W. H.	86	Goodrich, B. F., Co.	66	Mutty, L. J., Co.	89	Thomas, E. R., Motor Co.	54
Brown-Lipe Gear Co.	79	Goodyear Tire & Rubber Co.	75	Myers-Dayton Top Co.	93	Thompson, Chas. A., Co.	87
Buckeye Mfg. Co.	72	Gray & Davis	86	National Brazeing Co.	90	Timken Roller Bearing Co.	68
Buckeye Wheel Co.	86	Ham, C. T., Mfg. Co.	88	National Motor Vehicle Co.	59	Tingley, Chas. O., & Co.	86
Byrne-Kingston Co.	Cover	Hardy, R. E., Co.	89	National Spring & Wire Co.	93	Trebert Gas Engine Co.	79
Cadillac Co. of Illinois	92	Harris, A. W., Oil Co.	87	Newmastic Tire Co.	91	U. S. Electric Sign Co.	86
Cadillac Motor Car Co.	35	Hartford Rubber Works	63	New Process Rawhile Co.	84	U. S. Emergency Case Co.	96
Carbondale Chemical Co.	93	Hartford Suspension Co.	93	N. Y. & N. J. Lubricant Co.	93	U. S. Jack Co.	93
Carpenter Steel Co.	83	Hayes Mfg. Co.	85	New York Gear Works	81	Veeder Mfg. Co.	84
Champion, Albert, Co.	93	Haynes Automobile Co.	67	Nicholsburg, H., Mfg. Co.	88	Walker, E. C., Co.	78
Chicago Auto Heater Co.	87	Herz & Co.	91-94	Nordyke-Marmon Co.	62	Waltham Mfg. Co.	50
Chicago Automobile Show	58	Hofeller Brass Foundry Co.	89	Northern Mfg. Co.	60	Warner Instrument Co.	80
Cleveland Motor Car Co.	51	Holley Bros. Co.	92	Olds Motor Works	39	Way Muffler Co.	44
Coey, C. A., & Co.	92	Hyatt Roller Bearing Co.	96	Oliver Typewriter Co.	87	Wayne Automobile Co.	52
Continental Caoutchouc Co.	65	Imperial Brass Mfg. Co.	85	Owen Chemical Co.	74	Weber, O. F., Co.	92
Continental Engine Co.	86	Importers Co.	92	Pacific Tucking & Mfg. Co.	79	Weed Chain Tire Grip Co.	85
Continental Motor Mfg. Co.	94	Jeffery, T. B., & Co.	Cover	Packard Electric Co.	89	Weiss, Mat	87
Coops, C. W., Co.	91	Jones Speedometer	89	Packard Motor Car Co.	Cover	Welch Motor Car Co.	90
Corbin Motor Vehicle Corp.	47	Kimball, C. P., & Co.	88	Pardee-Ullman Co.	92	Western Oil Pump Co.	89
Correspondence School of Auto Engineering	62	Kirchberger, M., & Co.	81	Pedersen, J. T.	90	Western Tool Works	78
Corwin Mfg. Co.	83	Knoblock-Heideman Mfg. Co.	86	Pennsylvania Rubber Co.	67	Wheeler & Schebler	55
Cramp, Wm., & Sons, Ship & Engine Building Co.	84	Knox Automobile Co.	81	Pierce, George N., Co.	Cover	White Sewing Machine Co.	61
Crawford Automobile Co.	60	Leather Tire Goods Co.	89	Pittsburgh Reduction Co.	93	Whitlock Coil Pipe Co.	85
Cullman Wheel Co.	83	Lester, E. F.	89	Pittsfield Spark Coll Co.	82	Whitney Mfg. Co.	87
Daimler Mfg. Co.	65	Lexington Hotel	85	Pope Motor Car Co.	63	Willard Storage Battery Co.	84
Dayton Electrical Mfg. Co.	93	Light Mfg. & Foundry Co.	86	Prest-O-Lite Co.	82	Wills, E. J., Co.	91
Dayton Motor Car Co.	69	Link Belt Machinery Co.	71	Railway Appliances Co.	93	Winton Motor Carriage Co.	32
Diamond Chain & Mfg. Co.	93	Lobee Pump Co.	92	Rainier Co.	53	Witherbee Igniter Co.	89
Diamond Chain & Mfg. Co.	93	Locomobile Co. of America	46	Rajah Auto Supply Co.	91	Wolverine Auto & Commercial Vehicle Co.	82
Diamond Chain & Mfg. Co.	93	Logan Construction Co.	95	Reo Motor Car Co.	49	Wray Pump & Register Co.	84
				Rhodes, J. H., & Co.	86		



This is the Pierce Great Arrow 28x32 H. P. car with straight tonneau body, cape top and folding glass front. Price \$4,000. Cape top, extra, \$200.



The Pierce Arrow is an American car—the best American car that has been made—better in proportion to its cost than any imported French car—better for American use, American roads and the American motorist. It offers satisfaction, minimum of expense in running, perfect service, and can be operated by the owner.

Catalogue and Descriptive literature on request

The George N. Pierce Company, Buffalo, N. Y.

Member Association Licensed Automobile Manufacturers.

The Pierce Arrow exhibited in Madison Square Garden only.

List of Dealers

Boston, J. W. Maguire Co., 745 Boylston St.
 Chicago, H. Paulman & Co., 1321 Michigan Ave.
 New York, Harrolds Motor Car Co., Broadway, 58th-
 59th Sts.
 Pittsburgh, Bunker Bros. Co., Baum and Beatty Sts.
 Baltimore, Southern Auto Co., 2021 Maryland Ave.
 Buffalo, The George N. Pierce Co., 752 Main St.
 (retail).
 Detroit, J. P. Schneider, 189 Jefferson Ave.
 Denver, The George N. Pierce Co., 1643 California
 Ave.
 Hartford Conn., The Miner Garage Co., 120 Allyn St.
 Houston, Tex., Hawkins Auto & Gas Engine Co.
 Kansas City, Mo., E. P. Moriarty & Co., 1612 Grand
 Ave.
 Los Angeles, Bush & Burge, cor. 7th and Main Sts.
 Louisville, The Zorn-Strauss Co., Inc.
 Milwaukee, Hibbard Automobile Co.
 Ottawa and Montreal, Wilson & Co., 142 Bank St.
 Oakland, Cal., The George N. Pierce Co., 1013 Clay
 St. (wholesale).

Philadelphia, Foss-Hughes Motor Car Co., 201 N.
 Broad St.
 Portland, Me., J. A. Dowling.
 Providence, R. I., The Shepard Company.
 Rochester, U. S. Automobile Co., 21 Plymouth Ave.
 San Francisco, Mobile Carriage Co., Golden Gate Ave.
 and Gough St.
 Saratoga Springs, W. L. Hodges, 16 Woodlawn Ave.
 Scranton, Pa., Standard Motor Car Co.
 Springfield, Mass., E. R. Clark Auto Co., 117 Lyman
 St.
 Syracuse, Amos-Pierce Auto Co., 109 S. State St.
 St. Louis, Western Auto Co., 4701 Washington Blvd.
 St. Paul, C. P. Joy Auto Co., 368 Minnesota St.
 Toronto, Auto & Supply Co., Ltd., 24 Temperance St.
 Troy, N. Y., Troy Auto Exchange, 22 Fourth St.
 Utica, N. Y., Utica Motor Car Co.
 Geneva, N. Y., J. A. Place.
 Portland, Ore., H. M. Covey.
 Seattle, Wash., Broadway Auto. Co.

Rambler

WINTER MOTORING while enjoyable, is severe upon both car and operator. The Model 15 RAMBLER, 35-40 horse-power, here shown, has power and stability to withstand the mechanical strain, while the simplicity of control and dependability of operation reduces the driver's cares to the minimum. It has a four-cylinder vertical motor, sliding gear transmission and double chain drive with many details that will interest you.

Just your address — that's all.

THOMAS B. JEFFERY & COMPANY :: KENOSHA, WIS.

BRANCHES: CHICAGO MILWAUKEE BOSTON PHILADELPHIA SAN FRANCISCO
NEW YORK AGENCY: 134 West 38th Street
Representatives in all leading cities



